COURSE OF STUDY

SAN FRANCISCO.

1876.

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COURSE OF STUDY

IN THE

PUBLIC SCHOOLS

OF THE

City and County of San Francisco.

SAN FRANCISCO:
Thomas' Steam Printing House, 505 Clay Street.
1876.

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COURSE OF STUDY.

EIGHTH GRADE.

Time allowed to complete the work of this grade, from one to two years, according to the age and capacity of the child.

Language—

Reading and Spelling.—Charts from I to VI; First Reader, two exercises each day; first year to page 30. Spelling from the Charts and Reader, orally, and in writing on slates or paper.

The meaning of words to be made plain by conversation, and by using them in short familiar phrases and sentences. Carefully correct all faulty expressions of the pupils. Require them to construct short sentences, using common words from the Charts and Reader.

Writing.—Principles; Small letters; Capitals.

Arithmetic—

Add and subtract, multiply and divide numbers according to the "Grube System;" no combination to exceed 10, for the first year. Second year, the same to 16. (See Appendix.)

Oral Instruction—

(*a*) Local Geography. (Part I. Appendix.)

(*b*) First Series of Objects. (See Lessons on Objects in a Pestalozzian School.)

(*c*) Parts of the Human Body. (See Appendix.)

HIGH EIGHTH.

(*d*) Objects from the child's home: chair, clock, pin, thimble, knife, candle, soap, coal, plate, spoon, broom.

(*e*) Food: apple, peach, cherry, grape, potato, butter, milk, bread, sugar, salt.

(*f*) Some familiar plant, with roots, stem, branches and leaves.

(*g*) Animals: cat, dog, goat, hen and chickens, horse, sheep and lambs, cow, pig, duck, rabbit, mouse, rat, fish, fly.

For illustrations, see Sheldon's Elementary Instruction, pages 299 to 390. Also, Sheldon's Lessons on Objects, pages 96 to 144.

Morals—

Teach morals and manners, by enforcing habits of personal cleanliness, neatness in dress and obedience to parents; and by telling simple stories to illustrate the virtues of honesty, truthfulness and kindness. Teach maxims. Reference books for teachers: Cowdery's Moral Lessons, Willson's Manual, and Calkin's Object Lessons.

Music—

Sing by rote five songs from the authorized text-book in use (First Music Reader); also, the ascending and descending scales, giving the scale names and syllables.

Physical Exercises—

Physical exercises should be given at least twice a day; or, better still, whenever the children become weary and inattentive. For illustrations, see Adams' Physical Exercises.

Drawing—

Names of lines and simple drawing exercises on slates.

SEVENTH GRADE.

Time: One Year.

Language—

Reading and Spelling.—Second Reader, two exercises each day. Articulation to be distinct. Require pupils to tell in their own language what they have been reading about in their lesson; and let them frequently copy from the Reader a lesson or a part of a lesson, as an exercise in spelling, punctuation and capitals. Teach the names of common marks of punctuation in reading lessons. Spell words from Reader.

Grammar.—Swinton's "Language Primer," pages 1 to 12.

Writing.—Write on slates and blackboards, use pen and paper in classes provided with desks. Copy-books may be used once a week.

N. B.—Require pupils to give their answers in complete sentences, and be careful to correct faulty pronunciation and ungrammatical expressions.

Arithmetic—

Addition, subtraction, multiplication and division, according to the "Grube System;" highest combination 25.

For copious exercises see Robinson's Shorter Course, *First Book in Arithmetic*, pages 26 to 57.

N. B.—No book in the hands of pupils.

Oral Instruction—

(*a*) Local Geography. (Part II. Appendix.)

(*b*) Second Series of Objects.

(*c*) Colors: Primary and Secondary.

(*d*) Form: Four corners, side, edges, straight, curved, oblique, vertical, horizontal, slanting, parallel. Chart No. XI.

Morals—

Teach morals and manners, as in the Eighth Grade. Teach ten new maxims.

Music—

Continue the practice of the scales. Learn six new songs from the authorized text-book. Musical notation from the blackboard, the pupils to copy the notes and other signs, on their slates, to the following extent: notes, long and short; measures, bar and double bar; rests, short and long; the staff with the G cleff; the pitch and names of the degrees of the staff, and the scale in the key of C. For directions see Mason's National Music Teacher.

Physical Exercises—

Physical exercises, the same as in the Eighth Grade.

Drawing—

Lines, angles and names of common geometrical figures, simple drawing exercises on slates.

Review the study of lower grade. Carefully avoid too many concert exercises; they are not favorable to individual development.

SIXTH GRADE.

Time: One Year.

Language—

Reading and Spelling.—Third Reader. One or more exercises each day. Spell and explain all the important words in the lessons. Require pupils at every recitation to tell, in their own language, the subject matter of what is read. Copying and dictation of paragraphs, or short abstracts of reading lessons, daily. Special attention to be given to the use of conversational tones in reading. Punctuation marks. Use of italic and capital letters. Correct common errors of speech, and require pupils to give answers in complete sentences. Exercise in the correct use of is, are, said, seen, did, done, a, an, and the pronouns I and me, we and us; he and him.

Grammar.—Swinton's "Language Primer," pages 12 to 22.

Writing.—Write on paper, also on slates and blackboards, to learn proportion of small and capital letters. Copy-books to be used in this grade. Specimens should be furnished the Principals at least every two weeks, containing some of the small and capital letters, also a copy of some short paragraph or stanza.

The best position at small school desks is to sit with the right elbow resting on the right hand corner of the desk, the left elbow on the left hand corner, the body facing the desk squarely, the weight thrown lightly on the left arm, and the book placed diagonally on the desk.

Arithmetic—

Mental.—Robinson's Shorter Course. First Book in Arithmetic, pages 57 to 131, inclusive. Tables (addition, subtraction, multiplication and division).

Written.—Addition, subtraction, multiplication and short division, including dollars and cents; no number to exceed two periods. Frequent exercises on the slate and blackboard in addition, subtraction, multiplication and division: as $6\times7-2\div10\times9+4\div8-5=$how many? Explanation of the common fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{10}$, $\frac{5}{10}$.

N. B. No book allowed in the hands of pupils.

Oral Instruction—

(*a*) Local Geography. (Part III. Appendix.)

(*b*) Third Series of Objects.

(*c*) Color: Leading colors, shades.

(*d*) Form: square, parallelogram, right-angled triangle, circle, semi-circle; teach from the box of solids: cube, pyramid, sphere, cone, cylinder. No definitions.

(*e*) Weights and Measures: Representation of measurements as far as possible on the blackboard; yard, foot, inch. Teach Avoirdupois weight, United States Money, Time table, and how to tell the time of day by the clock.

Morals and Manners—

Teach morals and manners, as in lower grades. Commit to memory stanzas of poetry from the best authors, as directed by the Principal.

Music—

Continuation of songs through the First Reader, by rote, with a view of having the pupils learn the same by note. The signification of the repeat, the slur (the tie), and the following letters, p. pp. f. ff. mf. The scale in the key of C written upon staff with G clef.

Notation of whole, half, quarter and eighth notes, and their corresponding rests. Double, triple, quadruple and sextuple time and manner of beating. First Series of Music Charts for daily practice.

Physical Exercises—

Physical exercises shall be given twice a day.

No exercises should be over half an hour in length.

Drawing—

No. 1 Smith's Primary Cards and blank drawing book. Occasional dictation; memory and blackboard exercises and definitions.

FIFTH GRADE.

Time: One Year.

Language—

Reading and Spelling.—Fourth Reader; one exercise each day. Spell and explain all the important words in the lesson. At every recitation require pupils to give, in their own language, the subject matter of what is read. Short abstracts of reading lessons, at least three times a week. Cultivate a natural style of reading (Accent, Enunciation, Emphasis and Inflection). Word-book to seventh month. Vowel sounds.

Grammar.—Swinton's Language Primer, pages 23 to 57.

Writing—

Write the same as in the Sixth Grade. Use copy-books as directed by the Principal. Specimens as directed by Principal.

Declamation and Transposition.

Arithmetic—

Mental.—Robinson's Shorter Course. First Book in Arithmetic, pages 128 to 146 inclusive.

Written.—Long division, decimals limited to three places, and no divisor to contain a decimal. Simple exercises in fractions, as directed by Principal.

Geography—

Manual.—The Pacific Coast, pages 125 to 142; also from pages 5 to 23. Use the globe to teach the shape of the earth. Review of Higher Local Geography.

Oral Instruction—

(*a*) General review of form, size and color.

(*b*) Weights and Measures: Review Sixth Grade work, and take in addition, long measure, liquid measure, dry measure, paper counting, days in the different months of the year, the seasons.

(*c*) Animals: Teach the names of the most common or prominent animals on charts, their habits and uses, and where they live; omit all technical classification; describe the limbs of animals and their uses; the hand, and its substitute in animals; what instrument animals possess for attack and defense; wings and fins; clothing of man and animals; man's superiority to animals; intelligence of animals.

(*d*) Fourth Series of Objects. Chart XXI. Willson's Manual, pages 249 to 287.

(*e*) Botany: Willson's Charts, XX to XXII.

Morals and Manners—

Cowdery's Moral Lessons.

Music—

Music for daily practice, and songs and exercises, by note from the reader. Sharps and flats and their uses, The major diatonic scale, by its intervals, describing the major and minor seconds, and their position in the scale. For promotion, pupils should be able to write at dictation the notes and rests in general use; to write the staff and G clef; to write the major diatonic scale, with the scale names, pitch names and syllables; to read simple exercises or songs by note from chart or book in the key of C. Singing two-part exercises and songs shall commence in this grade.

Physical Exercises—

Physical Exercises, at least twice every day. See Adams.

Drawing—

No. 1, Intermediate; occasional dictation; memory and blackboard exercises; designing and definitions.

FOURTH GRADE.

Time: One Year.

Language—

Reading and Spelling.—Fourth Reader, four exercises each week. Require the pupil to give a full and intelligent explanation of the subject matter of the lesson, and the words used. One or more paragraphs of the reading lesson to be reproduced or written from dictation daily. Read with fluency, distinctness and suitable modulation. Word-Book to page 65.

Grammar.—Swinton's Language Primer, pages 59–102. Review the work of the lower grades.

Writing.—Write as directed by the Principal; specimens at request of Principal.

Declamation and Transposition. (See Appendix.)

Arithmetic—

Mental.—Robinson's Shorter Course, Part I, pages 13 to 76, pages 97 to 132, pages 143 to 164. *Written.*—Addition, subtraction, multiplication and division of decimals and common fractions; U. S. money; simple interest as applied to business in California; orders, bills and receipts; particular attention to be given to the analysis of operations; give miscellaneous problems pertaining to the practical business of life; frequent class drill on blackboard or slate in rapid combinations of numbers.

Geography—

Manual, pages 24 to 67. Map-drawing, pages 113 to 124 (one map monthly). Review Geography of Pacific Slope, pages 127 to 142.

Oral Instruction—

(*a*) Fifth Series of Objects, (Lesson 1 to 17).

(*b*) *Animals.*

MAMMALS.

Two-handed—Man.

Four-handed—Ape, monkey.

Flesh Eaters. Feline—Cat, lion, tiger, panther, leopard jaguar. Canine—Dog, wolf, fox, jackal.

Insect Eaters—Bat, mole, hedgehog. Amphibious—Seal, walrus.

Gnawers—Rat, mouse, beaver, rabbit, squirrel.

Solid-hoofed Animals—Horse, zebra.

Cud Chewers—Cow, sheep, deer, camel.

(*g*) Thick-skinned Animals—Elephant, hog, rhinoceros, hippopotamus.

BIRDS.

(*a*) Ravenous—Eagle, owl, hawk, condor.

(*b*) Perchers—Canary, nightingale, skylark, humming-bird, swallow, crow.

(*c*) Scratchers—Hen, turkey, dove, quail, pheasant, partridge.

(*d*) Climbers—Parrot, woodpecker.

(*e*) Runners—Ostrich, road-runner.
(*f*) Waders—Heron, stork, ibis.
(*g*) Swimmers—Duck, goose, swan.

For illustration, see Charts, Nos. XV, XVI, XVII, and XVIII; also, Willson's Manual, pages 130 to 177.

(*c*) Youman's First Book of Botany, pages 140 to 187.

Morals and Manners—

Teach morals and manners as in the lower grades.

Music—

Review of musical notation in the 5th and 6th Grades. Pupils taught the theory and practice of transposition of scales; to write the scales of C, G, and F major; to name the pitch of the sounds composing those scales in their order; to read and sing simple music in one or two parts by note in the keys of C, G, and F.

Second series of Charts and Second Music Reader.

Lessons by the special music teacher half an hour weekly.

Physical Exercises—

Give physical exercises twice a day.

Drawing—

No. 2, Intermediate. Occasional dictation; memory and blackboard exercises; designing and definitions.

N. B.—No book in Arithmetic allowed in the hands of pupils.

THIRD GRADE.

Time: One Year.

Language—

Reading and Spelling.—Fifth Reader; four exercises each week. Require a full and intelligent explanation of the subject-matter of each lesson. Dictations and reproduction of reading lessons, as in lower grades. Word-Book to page 100. Rules for Spelling in Word-Book.

Grammar.—Swinton's Language Lessons, pages 1 to 50.

Composition.—Compositions once in two weeks; Letter-writing, abstract of reading lessons, transposition, biographical or historical sketches. (See Appendix.)

N. B.—Compositions duly corrected must be filed in the office of the Principal.

Writing.—Write as directed by Principal. Specimens at request of Principal.

Declamation and Transposition. (See Appendix.)

Arithmetic—

Mental.—Robinson's Shorter Course, pages 175 to 232.

Written.—Decimal and common fractions, compound numbers, simple interest. Special attention should be given to the analysis of operations, particularly in common fractions. Tables: Linear or Long Measure, page 186; Surface or Square Measure; Cubic or Solid Measure; Wood Measure; Liquid Measure, Dry Measure, Avoirdupois Weight, Measure of Time, Circular Measure.

N. B.—No book in the hands of pupils.

Geography—

Manual.—Completed and reviewed. Map-drawing, pages 113 to 124 (one map monthly).

Oral Instruction—

(*a*) Fifth Series of Objects. (Lesson 18 to 36.)
(*b*) Hotze's Physiology. (Lesson 1 to 8.)
(*c*) Hotze's Physics. (Lesson 1 to 8.)
(*d*) Review Botany and Zoölogy of 5th and 4th grades.

Morals and Manners—

Conversational lessons on politeness and rules of deportment in public places and at home. Habits of personal neatness.

Music—

Major and relative minor scales, and major and minor intervals. Singing by note in the keys of C, G, F, D, A, B flat, and C flat. Two and three part exercises and songs shall be practiced in this Grade. Second and third series of charts. Lessons by the special Music Teacher half an hour weekly.

Physical Exercises—

Give physical exercises twice a day.

Drawing—

No. 2, Intermediate. Blank drawing-book for Plane Geometry. Occasional dictation and memory exercises; designing and definitions.

SECOND GRADE.

Time: One Year.

Language—

Reading and Spelling.—Fifth Reader, four exercises every week. Require a full and intelligent explanation of the subject matter of the reading lesson. Reproduction either oral or written. Frequent exercises in stress, emphasis, force, movement and pitch. Teach pupils to distinguish sounds as marked in Webster's Dictionary. Word-Book completed.

Word Analysis.—Part I. Difference between open and closed syllable. Divide Latin prefixes as follows:

Open Syllables.	*Closed Syllables.*
Ante, contra, de, extra, intro, pre, pro, re, retro, se, sine.	Ab, ad, am, circum, con, dis, ex, in, inter, ob, per, post, preter, sub, subter, super, trans.

Explain and illustrate what is meant by assimilation of letters, especially of the liquids: l, m, n, r.

Grammar.—Swinton's Language Lessons, pages 50 to 98.

Composition.—Letter-writing, abstracts of lessons, transpositions, biographical or geographical sketches once in two weeks. (See Appendix.)

N. B.—Compositions, duly corrected, must be filed in the office of the Principal.

Writing.—Write as directed by Principal.

Declamation and Transposition. (See Appendix.)

Arithmetic—

Mental.—Robinson's Shorter Course, Part I, and pages 29 to 45 of Part II. *Written.*—Practical Arithmetic, section 240 page 212, omitting sections 99, 189, 190, 191, 202, 203, 204, 205, 224, 225, 226, 227, 228, 229, 230; also, examples 28, 32, 33, in section 230.

Frequent blackboard drill on practical questions involving the applications of the principles which have been taught.

Simple interest, as in lower grades. Teach notes, bills of parcels, receipts, and orders.

Frequent drill in rapid mental combinations of numbers, especially in adding columns of figures.

Geography—

Physical.—Part I, sections I to IX. One exercise weekly on on the Reviews and Routes of Travel of Part II. Map-drawing once a month.

History—

1. Discoveries.—Columbus, Cabot, Vespucius, Cortez, De Soto, Cartier, Drake, Northmen.

2. Colonial History.—Brief account of the following settlements: Jamestown, Plymouth, New York, St. Augustine, Pennsylvania, Maryland, California.

Noted Names.—John Smith, Hudson, Roger Williams, King Philip, Lord Baltimore, Penn, Edmund Andros, Oglethorpe.

Nature of the Colonial Governments, five paragraphs.

Review of Colonial progress, seven pages.

French Wars.—Page 90, four paragraphs. Capture of Louisburg; Washington's first campaign; Braddock's campaign; Conquest of Quebec.

Noted Names.—La Salle, Marquette, Hennepin, Wolfe, Montcalm, Pitt, Washington, Braddock, Pontiac.

Revolutionary War.—Complete from pages 109 to 155.

Noted Names.—Hancock, Patrick Henry, Hamilton, Samuel Adams, General Gage, Ethan Allen, General Howe, Burgoyne, Arnold, General Greene, Putnam, Knox, Andre, Lafayette, Cornwallis, Franklin, Morris, Paul Jones, Marion, Sumpter, Gates, Cosi, De Kalb.

Oral Instruction—

(*a*) On Earths (Lessons on Objects in a Pestalozzian School.)
(*b*) On the Senses (same book).
(*c*) Hotze's Physiology (Lessons 9 to 23).
(*d*) Hotze's Physics (Lessons 9 to 22)

Morals and Manners—

Same as in the third grade.

Music—

Chromatic and minor scales, major and minor intervals. Review of lessons and exercises in the first part of the song-book, singly and in concert. Simple exercises in the usual keys by note, at sight. Pupils required to read by note, individually, in all the keys in general use. Songs and exercises of two and three parts for class practice.

Third series of Chart Lessons by the Special Music Teacher, half an hour, weekly.

Physical Exercises—

Give physical exercises twice a day.

Drawing—

During the year: No. 2, Geometry. No. 3, Free Hand. Occasional dictation, exercises and designing.

Written reviews every Friday.

FIRST GRADE.

Time: One Year.

Language—

Reading and Spelling.—Fifth Reader, four exercises each week. Explanation of subject-matter. Reproduction either oral or written. Frequent drills on inflection, emphasis, pitch, force, movements. Spelling and explanation of words in connection with reading lessons, and with written exercises in other studies.

Word-Analysis completed.

Grammar.—Swinton's Language Lessons, pages 98 to 176. Review the same.

Composition.— Letter-writing, abstracts of reading lessons, transposition, biographical sketches of eminent men, description of places visited by pupils once in two weeks. (See Appendix.)

N. B.—Compositions, duly corrected, must be filed in the Principal's office for inspection.

Writing.—Write as directed by Principal.

Declamation and Transposition. (See Appendix.)

Arithmetic—

Mental. — Robinson's Shorter Course, Parts I and II. *Written.*—Longitude of time, simple and compound interest, commission and brokerage, stocks (omit U. S. Bonds), profit and loss (by business methods), banking, ratio, proportion, square root and mensuration. Frequent drills in adding columns of figures; blackboard drill in practical business questions; notes, orders, and bills of parcels.

Geography—

Physical Geography, Part I, sections 10 to 20; also pages 49, 108 and 109. Geography of the Pacific Slope, pages 115 to 125. One exercise weekly on the Reviews and Routes of Travel of Part II. Map-drawing on blackboard.

Review from time to time, using the following analysis of topics: Country, Name, Signification.

I. Position and Extent vs. Boundary.—Mathematical Geog. 1. Latitude and Longitude. Difference in Time. 2. Map-drawing.

II. Surface.—1. External. Physical Geog. Land Systems. Water Systems. 2. Internal Structure. Geology.

III. Soil.—Chemistry.

IV. Climate.—1. Physical Geog. Meteorology. 2. Astronomy.

V. Products.—1. Animal. Ethnology. Zoölogy. 2. Mineral. Mineralogy. Metallurgy. Precious Stones. 3. Vegetable. Agriculture. Botany.

VI. Manufactures and Commerce.—Political Economy. Capital and Labor. Exports and Imports. Monetary Systems.

VII. Man.—1. Origin and Progress. History. 2. Language. Philology. 3. Literature. Myths and Traditions. Romance. Philosophy, 4. Art, 5. Religion.

VIII.—Politics.—1. Science of Government. Law. 2. Administration of Government. 3. Military and Naval Science.

City.—1. Name and Meaning. 2. Location. 3. Size. Comparison. 4. Architecture. Public Institutions. 5. Resources. Manufacturing. Commercial. Educational. 6. Interest to Travelers. Nature. Art.

U. S. History—

Washington's Administrations, entire.
John Adams' " one important event.
Jefferson's " " " "
Madison's " " " "

War of 1812.—Causes of the war. Naval operations of 1812. Sea fights of 1813 and 1814.

Battle of Lake Erie. Battle of Chippewa and Lundy's Lane. Battle of New Orleans. Capture of Washington. Hartford Convention.

Noted Names.—Perry, Scott, Decatur, Jackson, Packenham, Tecumseh.

Missouri Compromise; Monroe Doctrine; Protective Tariff.

In Jackson's Administration—U. S. Bank Nullification; Osceola.

In Van Buren's Administration—Panic of '37.

Harrison's Administration—U. S. Bank; Dorr's Rebellion,

Mexican War.

Causes—Battles of Palo Alto, Resaca de la Palma, Monterey, Buena Vista, Vera Cruz (siege), Puebla, Capture of City of Mexico.

Noted Names—Scott, Taylor, Kearney, Fremont, Doniphan, Sloat, Stockton.

Administrations of Taylor and Filmore—Compromise Bill.

Administration of Pierce—Gadsden Purchase; Kansas-Nebraska Bill.

List of Presidents, Page 204, paragraph II.

Louisiana Purchase; Annexation of Texas; Founding of Pacific States. Section III, pages 226 to 235.

War of Secession—Causes.—Political events of 1861; Campaign of 1861; Bull Run; Blockade; Foreign Relations; Trent Affair.

1862.—Mill Spring; Forts Henry and Donelson; Shiloh; Murfreesboro; Peninsular Campaigns; Antietam; Fredericksburg; New Orleans; Merrimac and Monitor.

1863.—Emancipation Proclamation; Chancellorsville; Gettysburg; Vicksburg; Port Hudson; Chicamauga; Lookout Mountain.

1864.—Wilderness; Spottsylvania, C. H.; Cold Harbor; Petersburg; Siege of Washington; Sheridan's Valley Campaign; Sherman's Campaigns and March, Alabama and Kearsarge.

Final Campaign.—Five Forks; Lee's Surrender.

Noted Names.—Lincoln, Grant, Scott, Seward, Meade, Davis, Thomas, Lee, Butler, Stonewall Jackson, J. E. Johnston, Albert Sydney Johnston, Lyon, Baker, McDowell, Sheridan, Rosecrans, Farragut, Burnside, Banks, Fremont, Stanton, Longstreet, Hood, Semmes, Porter.

General facts of the struggle.

Johnson's Administration.—Amnesty; Reconstruction; Thirteenth and Fourteenth Amendments; Public Debt; Revenue; Century of Progress.

Oral Instruction—

(*a*) Metals and Earths.
(*b*) Hotze's Physiology, completed.
(*c*) Hotze's Physics, completed.

Morals and Manners—

Cowdery's Moral Lessons, Sheldon's Elementary Instruction, pages 413 to 418.

Music—

Exercises of the Second Grade reviewed and continued. Singing easy songs and exercises by note at sight, practice reading and singing in all the keys in general use. Music of two and three parts, for daily practice.

Third series of Charts. Lessons by the special Music Teacher, half an hour, weekly.

Physical Exercise—

Give physical exercises twice a day.

Drawing—

During the year: No. 1, Model and Objects; No. 3, Geometry; No. 4, Free-hand and Designing.

Written review every Friday. Review studies of the lower grades.

◆

GIRL'S HIGH AND NORMAL SCHOOL.

COURSE OF STUDY.

Junior Class.—First Year.

Studies.	*Weekly Recitations.*	*Hours.*
Algebra and Arithmetic	5	5
History	3	3
Botany and Physics	4	4
Literature and Grammar	5	5
Drawing and Music	2	2
Spelling and Word-Analysis	2	2
Reading	2	2

Arithmetic and Grammar pursued with special reference to methods of teaching, under the direction of the Principal.

MIDDLE CLASS.—Second Year.

Studies.	*Weekly Recitations.*	*Hours.*
Algebra and Arithmetic	4	4
History	3	3
Literature and Composition	3	3
Physics and Chemistry	4	4
Drawing and Music	2	2
Reading and Word-Analysis	2	2
Geography	3	3

SENIOR CLASS.—Third Year.

Studies.	*Weekly Recitations.*	*Hours.*
Physiology and Zoology	4	4
Geometry	3	3
Literature and Composition	3	3
Physical Geography	3	3
Music and Drawing	1	1
Reading and Spelling	1	1
Chemistry	3	3

NORMAL WORK.

I. Lectures on School Law and School Government.
II. Methods of Teaching.
III. Observing Work in Primary Schools.
IV. General Review.
V. Preparation for Examination.

Optional in the entire Course: French and German.

Drawing—

Seniors.—Geometrical and Pictorial Perspective. Drawing from models and designing.

Middle.—Geometrical and Pictorial Perspective. Model and object drawing and designing.

Juniors.—Geometrical Perspective. Model and object drawing; plane Geometry and designing.

SAN FRANCISCO BOYS' HIGH SCHOOL.

COURSE OF STUDY.

[Adopted May 2, 1876.]

HIGH SCHOOL COURSE.

JUNIOR.

English.—English Grammar—The Lady of the Lake, or Marmion, read critically. Autobiography of Franklin, Hawthorne's True Stories, from history and biography, and Hawthorne's Wonder Book read, and abstracts of them written (so far as time will admit). Reading from Underwood's Hand-book of English Literature. Dictation, Spelling, Definition—5.

Mathematics.—*Algebra* (to equations of the second degree)—Arithmetic review—4.

History.—Dickens' History of England—3.

Elective Study.—3.

Vocal Culture.—Once a week, except on declamation week.

French *German*, Electives. *Bookkeeping*, *Drawing*, Optionals.

MIDDLE.

English.—Shaw's History of English Literature. The Tempest; A Christmas Carol; Milton's Comus and Lycidas; Reading from Underwood's Hand-book of English Literature; Dictation, Spelling, Definition—3.

Mathematics.—*Algebra* to Chapter VIII. *Geometry*—4.

Science.—3.

History.—Outlines of the World's History, to be filled up by reading from Epochs of History and other historical works—3.

Elective.—3.

French, *German*, Electives. *Drawing*—Optional.

SENIOR.

English.—Shaw's New History of English Literature. The Merchant of Venice; Julius Cæsar; the Vicar of Wakefield—3.

Science.—4.

History.—Outlines of the World's History, to be filled up by reading from Epochs of History and other historical works—3.

Political Economy.—Political Economy for Beginners—2.

Elective.—3.

French, } Electives.
German, }

GENERAL DIRECTIONS.

One elective must be taken, and the other elective or one of the optionals—but only one—may be taken by pupils of excellent scholarship, provided the exercise in no way interferes with the regular work.

Four carefully-selected and carefully-prepared declamations during the year for all classes. Each boy should receive only his proportion of the time given to declamation.

Such exercises in Physical Geography, Physiology and Mineralogy as there may be found time for.

BUSINESS COURSE.

English.—With the Juniors—5.

Mathematics.—With the Juniors and Middle Class—6.

Book-keeping.—3.

Political Economy.—With the Seniors—2.

UNIVERSITY COURSE.

JUNIOR.

Classical and Literary.

Latin.—Introductory Latin Book; Latin Reader; Latin Composition—5.

Mathematics.—With the Juniors of the regular High School course. [The Classical Division need not review Arithmetic]—4.

English.--With the Juniors of the regular High School course--5.

History.— } History of Greece, first term—2.
" " Rome, second " —2.

Vocal Culture.—Once a week, except on Declamation week—1.

French, Drawing,
German, Bookkeeping, } Optionals—3.

MIDDLE.

Latin.—Cæsar ; Cicero ; Virgil begun ; Latin Composition—5.

Greek.—First Greek Book ; Greek Reader begun ; Greek Prose Composition--5.

Mathematics.—With the Middle Class of the regular High School course—4.

History.—With the Middle Class of the regular High School course. [The Classical Division may omit history]—3.

English.--Pupils preparing for the Literary course of the University omit Greek, and take English with the Middle Class of the regular High School course. [The Classical Division may omit Shaw's English Literature]—3.

French, German,
Drawing, } Optionals—3.

SENIOR.

Latin.—Virgil continued ; Review the Latin of the course ; Latin Composition—5.

Greek.—Second Greek Book completed ; Greek Reader ; Homer, Books I and II ; Review the Greek of the course ; Greek Composition—5.

History.—Outlines of the World's History, etc., with the Seniors of the regular High School course. [The Classical Division review the History and Geography required for the admission to college]—3.

Mathematics.—Review the mathematics required for admission to the University.

English.—Pupils preparing for the Literary course of the University omit Greek, and take English with the Seniors of the regular High School course. [The Classical Division may omit Shaw's English Literature.]

French,
German, } Optionals.

GENERAL DIRECTIONS.

Translations from the Latin and Greek once a week, with special reference to good idiomatic English.

Four carefully-selected and carefully prepared declamations during the year. Each boy should receive only his proportion of the time given to declamation.

Pupils preparing for college are not required to pursue their studies beyond what is necessary for admission to college ; and they may, at the discretion of the Principal, leave off any study not required for admission, and be put on such studies as are required for admission.

One optional, and one only, may be taken by exceptionally good scholars, provided the exercise in no way interferes with the regular work. Pupils pursuing the Classical course are advised not to take an optional.

SCIENTIFIC.

Pupils preparing for the Scientific Course in the University are recommended to pursue the studies of the Junior and Middle years in the regular High School course ; but pupils whose rank in the Grammar School was exceptionally high, and whose parents so wish, may elect from the studies of the Junior and Middle classes such studies as are required for admission to the University, and pursue them only, and thus prepare for the University in one year. Pupils taking this course may omit Dickens' History of England, and review U. S. History, Geography, etc.

(The course of study serves to indicate, as nearly as can at present be determined, the kind of work required of each class ; and the numerals opposite each subject, on the right, indicate, approximately, the number of recitations per week on that subject.)

ADVANCED COURSE.

Latin.—Cæsar, Books V and VI ; Cicero,—two additional orations, or the Cato Major ; Ovid, four thousand lines, or the last five books of the Æneid. Review the Latin for the course, especially Latin Composition.

Greek.—Homer's Iliad, Books I, II and III; review Goodwin & Allen's Greek Reader, or Xenophon's Anabasis, Books I to IV, inclusive; and the Seventh Book of Herodotus, and Greek Prose Composition.

Mathematics.—Review Arithmetic, including the metric system of weights and measures, together with the use and the rudiments of the theory of logarithms. *Algebra*—Through quadratic equations.

Plane Geometry.—As much as is contained in the first thirteen chapters of Pierce's Geometry.

Ancient History and Geography.—Review Greek History to the death of Alexander; Roman History to the death of Commodus.

Modern and Physical Geography.—Review an equivalent of Guyot's Common School Geography; also, an equivalent of parts II and III of Guyot's Physical Geography, or the first forty-nine pages of Warren's Physical Geography.

English Composition.—Review Shakespeare's Tempest, Julius Cæsar, and Merchant of Venice; Goldsmith's Vicar of Wakefield; Scott's Marmion.

Physical Science.—The rudiments of Physics and Chemistry (as much as is contained in Balfour Stewart's Primer of Physics, and Roscoe's Primer of Chemistry).

French.—Review French.

Drawing—

Seniors.—Geometrical and Pictorial Perspective. Drawing from models and designing.

Middle.—Geometrical and Pictorial Perspective. Model and object drawing and designing.

Juniors.—Geometrical Perspective. Model and object drawing; plane Geometry and designing.

REGULATIONS

REGARDING PROMOTION. THE AWARDING OF DIPLOMAS, ETC.

I.

Promotions shall be made and diplomas shall be awarded on the average result of the examinations conducted by the teachers, and that obtained on the examination given under the direction of the Board of Education; and 70 per cent. shall be necessary for promotion.

II.

Diplomas shall be awarded only to pupils who satisfactorily pursue one of the regular High School courses.

III.

Pupils who receive a general average of 90 per cent. or more, on one of the regular High School courses, shall be entitled to a Diploma of Honor.

No study shall be regarded as having been satisfactorily pursued unless the pupil shall have completed it with an average of not less than 60 per cent.; and no High School course shall be regarded as having been satisfactorily pursued if a pupil fails satisfactorily to pursue any one of the studies in the course selected.

IV.

Pupils who do not pursue a regular High School course, or pupils who fail satisfactorily to complete a regular High School course, shall be entitled to a certificate on which shall be mentioned the studies that have been satisfactorily pursued.

APPENDIX.

APPENDIX.

SPECIAL NOTICE.

All lessons on oral instruction must be prepared at home, and no book must be used before the class.

Principals may allow teachers of the same grade to exchange classes in one or more studies.

1.—THE HUMAN BODY.

Its name: Body. Parts: head, trunk, limbs. Number of parts, one head, one trunk, four limbs. Which parts of the body are double? arms, legs, hands, feet. Material: bones, flesh, blood; hard, soft, and fluid parts. Position of head, trunk, limbs. Changes in the body: growth, sickness, fatigue, heat, cold, injuries, death.

Animals also have bodies. What animal has a small body? what one a large body? what one a long body? what one a thick body?

1. The Head.—Form: round. Position: on the trunk. Parts: forehead, back, top, crown, face. Natural covering: hair. Baldness: little babies, old men. What men and boys wear on head: hats, caps. Hats and caps made of: straw, silk, felt, fur, cloth. What women and girls wear on their heads: bonnets, hats, caps, nets, ribbons, wreaths, flowers. Motions of head: nod, bow, shake, turn, hold upright. Headache. Heads of animals.

2. THE TRUNK.—Position: below head, above limbs. Parts: chest, abdomen, back. Limbs attached to trunk: legs, arms. Relative position of parts: abdomen below breast, etc. Motions of body: bend, turn. Dress: shirt, pants, vest, coat, jacket, uniform, overcoat. Condition: stout, thin, slender, crooked, (humpback). Rules: bathe, wash.

3. THE LIMBS.—Name: arms, legs. Position: arms above and on each side; legs below and near together. Number: two legs, two arms. Dress: the same as trunk. Number of parts of body: of which parts have we one? of which two? of which ten? of which too many to count?

4. THE HAIR.—Place. Color: black, white, brown, blonde, reddish, grey. Kinds: smooth, bristly, curly. Length: long, half-long, short. Purpose: warmth, ornament. What is done to the hair: comb, brush, cut, oil, curl, braid, coil, etc.; difference in youth and age. What is made of hair: rings, brooches, chains. Beard: mustache, side-whiskers, full beard. Rules: comb, brush, keep clean; not let hang in eyes, not pull other's hair. What animals are covered with hair?

5. THE EARS.—Place: each side of head. Parts: external or outer, internal or inner. Number. Use: to hear. What we hear with them: (names of different sounds,) singing, speaking music, rustling, rattling, thunder, ringing of bells, clapping, cracking, rolling, etc. What causes these sounds? What sounds do we like to hear? What do we not like to hear? What injures the hearing? explosions, blows. Deafness. Wax of the ear: its purpose. Ornaments for the ears: rings (gold, jet, pearls, etc.) Rules: keep clean. How? with what?

6. THE FACE.—Place: it forms the front part of the head. Parts: brow or forehead, nose, eyes, temples, cheeks, mouth, chin. Relative position of these parts: above, below, between. Color: red, white, pale, (negro, chimney-sweep, etc.) Other appearances: swollen, thin, sunken, smooth, bearded. Youth: full, rosy. Age: pale, wrinkled, haggard. Motions: laugh, weep, look, joyful, angry, ashamed, friendly, sullen. Rules: wash; not cut, make grimaces, nor be vain of a pretty face. Disfigured by: small pox, burns, cuts.

7. The Forehead.—Place. Material: bone, skin. Surrounded by: hair, temples, eyes, nose. Youth: smooth. Age: wrinkled. Motions: wrinkle, frown, or scowl. Rules: keep clear and unclouded.

8. The Eyes.—Place: below—at both sides. Number: two; right, left. Parts: eyebrows, eyelids, eyelashes, eyeball. Use of different parts: eyebrows (color) to protect from perspiration—ornament; eyelids to protect from dust and other things—to make more safe in sleep; to clean the eye frequently as we wipe the window glass; eyelashes, to shut more closely, to protect. Seeing. What do we see? form, size, color, motion, nearness, or distance of things. Forms seen: round, angular, long, short, broad, narrow, sharp, dull, smooth, rough. Sizes seen: large, small. Colors: green, red, etc. Motions seen: running jumping, hopping, swimming, flying, turning, trembling, riding, etc. What things are near? far? (Diminution of size according to distance.) Motions of eye: open, close, wink, turn, roll, stare, squint. Aids to eye: spectacles, opera-glasses, spy-glasses. Blindness. Tears; whence do they come? when shed? (joy, grief). Rules: keep clean; not look at dazzling light (sun, fire); not read with dim light; not hold book too near.

9. The Nose.—Place: below, above, between. Form: straight, crooked, short. Parts: ridge, point or end, bridge, nostrils. Use: breathe, smell. What we like to smell: flowers, food, fruit, perfumes. What we do not like to smell: decayed fruit, spoiled eggs, decayed meat, dead animals. Ornaments: rings (savages). Nosebleed. Rules: hand or handkerchief before it when you sneeze; keep clean; always carry handkerchief; not snuffle; always breathe through nose when possible.

10. The Mouth.—Place: below, above. Parts: lips (upper and under), teeth, tongue, gums. Color: red. Use: speak, eat, whistle, breathe, sing. Motions: open, close, distort. Rules: wash out; keep closed; not distort; not bite or draw in lips. Different names for different animals: beak, bill, snout, muzzle. What animals have a beak, etc.?

11 The Teeth.—Place: in mouth; upper jaw, lower jaw. Number: twenty-eight to thirty-two. Kinds: incisors or cutting

teeth, canine or tearing teeth, molars or grinding teeth. Color: white; diseased teeth: yellow, brown, black. Functions: biting, holding fast, chattering, grinding. Use: to chew, talk, ornament. Youth: complete, white. Age: fallen out, hollow. Toothache. Extracting teeth. Artificial teeth. Rules: brush, wash, bite no hard substances, not eat too many sweets, not pick with needles or pins.

12. The Tongue.—Place: in mouth. Form: long, thick. Color: red (fever, white coating). Motions: very mobile; can be stretched, shortened, drawn back, laid at top of mouth, arched, rolled. Use: to speak, whistle, taste, Rules: not to smack, not to run it out of the mouth. Bible—The tongue is a little member, etc.; swearing, praying, praising, abuse.

13. The Neck.—Place: between. Characteristics: thin, thick, short, long. Use: to support the head; contains the trachea or windpipe, and the œsophagus or gullet. Motions: turn, bend backwards and forwards. Dress: scarfs, cravats, collars, ruffles, chains, ribbons. Rules: not wrap too much around it; not dress it too tight; wash; not bend too far backwards. Necks of geese, horses, swine, etc.

14. The Chest.—What are the principal part of the trunk of the body? Parts of the chest: ribs, heart, pit of stomach. Motions: heave, sink, expand, contract, beating of heart. Rules: not dress too tight; upright position in standing, walking, sitting—throw chest forward.

15. The Hands.—Left, right. Parts: wrist, palm, fingers. Number. Parts of the finger. Only two thumbs. Nails: number. Use: ornament, protection, defense, scratching. Rules: pare or cut, not bite off, not scratch others with them.

Purpose of the entire hand: to eat, wash, dress, defend, work, etc. What kind of work? file, bore, plane, hammer, cut, sew, etc. Defense without weapons: to push, strike, seize, hold fast, strangle. Fists. Defense with weapons: sticks, clubs, swords, daggers, pistols, etc. Artistic accomplishments: perform music, drum, write, draw, paint, embroider, engrave. Dress: gloves. Rules: keep clean, not to play with in the school-room. Monkeys and apes have also arms and hands.

16. The Legs.—Right, left. Number. Parts: thigh, knee, lower leg, calf, ankle, foot. Motions: extend, draw up, lift, bend, stoop. Uses: to stand, walk, run, skip, jump, dance, climb, swim. What people make great use of their legs in doing their work? Organ-players, letter-carriers, soldiers. Changes of condition: fatigue, lameness. Rules: not to be foolishly bold in jumping. Broken legs. What animals have two legs? four? six? eight? more than eight? What objects without life also have legs?—tables, chairs, etc.

17. The Foot.—Number: right, left. Parts: ankle, heel, sole, toes (ten). Compare toes with fingers. Uses: to stamp (same as of legs). Dress: stockings, shoes, slippers, boots, spurs, skates. Rules: turn outwards in walking, not sprain by leaping, not tread too heavily in the house, not tread on worms under your feet.

2.—NEEDS OF THE BODY.

I. Food.—(*a*) Food from flour: bread, cake, crackers. (*b*) Food from animals—Meat: beef from cows, pork from swine, veal from calves, lamb and mutton from sheep, venison from deer, etc. Birds: geese, ducks, chickens, pigeons, turkeys, larks, quails, etc. Fish: oysters, crabs, salmon, smelts, etc. (*c*) Food from fruits: cherries, berries (name kinds), peaches, plums, apricots, grapes, figs, pears, apples, nuts. (*d*) Food from roots: potatoes, carrots, turnips, radishes, onions, beets. (*e*) Food from leaves: salad, cabbage, parsley, etc.

Different ways of preparing food: eaten raw, viz: cucumbers, salad, fruit; cooked, viz: meat, vegetables, fruit, etc.; roasted or baked, viz: meats, fruits, etc.; smoked, meat; preserved, fish, fruit, vegetables. Rules: do not eat too much; do not drop any pieces or crumbs; divide with the hungry; feed birds. Famine.

II. Drinks.—Kinds of drink. (*a*) According to temperature: cold, warm, hot. (*b*) According to taste: tasteless (water), sweet, sour, bitter (medicine), pleasant, unpleasant. (*c*) According to color: colorless, water; yellow, wine; white, milk; red, wine; brown, beer, coffee. What do we drink cold? warm? hot? What kinds of dishes do we drink from? cups, goblets, glasses. Thirst, great suffering. Rules: not to drink when very warm; not to take too much strong drink. Drunkards.

III. Sleep.—What we observe in a sleeping person: eyes closed, lies motionless, only the chest moves (why), conscious of nothing, breathes. When people sleep: at night; little children, sick people, old people: day and night. Where people sleep: in sleeping rooms, on stacks of hay, on the ground, in tents, (travelers, soldiers, shepherds, etc.). Purpose of sleep: rest, strength. Rules: not sleep too long (sluggards, not have to be called twice to get up; not forget to say prayers; lay your clothes in order when you undress; say "Good night" to father, mother, and all others. Dreams.

IV. Clothing.—What kinds of clothing we wear; review of lessons on head, trunk, feet, etc. What people work to make our clothes: tailors, shoemakers, cloth-weavers, stocking-makers, hat, cap and glove-makers, milliners, dressmakers, seamstresses, etc. Where we get the material to make our clothes: from the vegetable kingdom, cotton, flax; from the animal kingdom: wool from sheep, fur from wild animals, hair from the goat, silk from the silk-worm; from the mineral kingdom: iron, steel, brass, silver, gold. Material for cool clothing; for warm clothing; colors. Places to keep clothes: closets, wardrobes, trunks, bureaus, valises. Old clothes. Use of rags. Rules: keep clothing clean (brush, beat); keep it mended; give to the poor what you no longer need.

3.—THE CHILD AS SCHOLAR.

Where are you? in school. When do you come to school? in the morning. At what time in the morning? When do you go home? in the afternoon. At what o'clock in the afternoon? How many hours do you stay in school every day? What days of the week is there no school? Then how many days in the week is there school? What do you come to school for? to learn. To learn what? reading, writing, singing, etc. Who teaches you these? What are you, of his? Whose pupil (scholar) are you? Conclusion: every child that goes to school is a scholar. What are the scholars in the other classes? boys, girls, older, younger. How many scholars are in your class? How can we divide them? large, small; older, younger; good, naughty; industrious, idle; neat, untidy; punctual, tardy; obedient, disobedient.

Duties of the Scholar.—(*a*) At home before starting for school: get up in season; comb hair; dress carefully; sharpen pencils; put together all the things needed to carry to school; bid "Good morning." (*b*) On the way to school: not loiter; not be noisy; not stop on the way; greet acquaintances. When to say "Good morning;" when, "Good evening;" when to take off caps. Look out for horses and teams. (*c*) Coming to school: be punctual; take seat quietly. With what to be busy: reading, writing, drawing. What not to do: make noise, jump over the seats, stand on the desks, tease others. (*d*) During lessons: sit straight, be attentive, look at the teacher, observe, answer. How: loudly, distinctly, completely. Not prompt or tell others; not be uneasy, disturb others, play, or look around the room. (*e*) Going home from school: same as going to school.

In the same way and according to the plan given under E, let the following subjects be taken up: slates; writing materials in general; slate pencils; rulers; inkstand; abacus; reading book.

4.—LOCAL GEOGRAPHY.

(*a*) *Purpose of the Study of Local Geography, and its Relation to other Studies.*—The aim of this branch of instruction is to give a knowledge of home. But we must be exact, for how much may be comprised in the term *knowledge of home!* It comprises the visible phenomena of the heavens and of the atmosphere, the face and nature of the soil, also its irrigation ; still further, the native animals, plants and minerals ; the artificial productions of its inhabitants ; their dwellings and principal occupations ; their social and foreign relations (the latter being generally expressed by trade and its channels) ; and, finally, the history of the place. Of course it is easy to see that all these subjects cannot be exhaustively treated in this branch of instruction ; that would be the work of a lifetime, and more ; think for a moment merely of the native plants and animals, and the historical part. Such is not to be the task of the instructor in local geography ; to speak figuratively, he is not to count the stones in the street, nor the shingles and slates on the roof ; he has, rather, only to teach what would be found in *any* good geography of any country, province or district. We should therein find mention of the natural and artificial productions, and of the history of the land, but only of the most important and characteristic, together with one or more marked, peculiarities ; but we should find no complete enumeration, description or representation of these. The instruction of *local* geography must be the same ; here, also, mention is only to be made of the most important and most striking natural productions, omitting all details ; here, too, we should find something of history, but only of those events and occurrences of which the place mentioned has been the scene.

But has the geography of a country nothing to do with the sun, moon, stars and storms? General geography speaks of the revolution of the earth on its axis ; of its relation to the other heavenly bodies, particularly to the sun ; of climate and seasons ; and for this division of general geography, observation of the native skies and of the atmosphere, may be a preparation. Thus local geography is essentially of a *geographical* nature, and, as such, is to be especially preparatory to future geographical studies.

Local geography also prepares for other branches of instruction ; for instance, as already mentioned, *the natural sciences*, in giving the names and localities of certain plants, animals, etc. ; *natural philosophy*, in taking notice of common natural phenomena to be observed by the eye ; history, in looking back into the past.

Local geography is also very important in teaching the command of *language*, inasmuch as the teacher should insist upon the correct, clear and complete expression of what has been clearly comprehended. It also affords abundant material for short *written* exercises. It even touches upon *mathematics*, since, now and again, there are distances to be measured and counted, if only by steps.

Finally, *drawing* is another branch which local geography uses as her hand-maid in the representation of different geographical forms, in turn serving her again by thus training hand and eye for the study of drawing.

(*b*) *Art and Manner of Instructing.*—Local geography is an integral part of sense-perception, or object teaching, and, as such, should be commenced with the child's first entrance into school. The purpose of object teaching is to lead children to observe and to describe objects seen ; it is to practice the senses of the child in correct perception and conception, and, for this purpose, different objects are selected for the child to examine. It also introduces subjects and phenomena which cannot be directly produced before him, but which the child has already perceived or can perceive outside of the school-room ; in a word, phenomena lying within the sphere of the child's life. In this way the child attains to a conscious knowledge of various perceptions already made by him, and these become regulated and raised to the rank of distinct ideas. But here the teacher has to guard against proposing too much to himself, since, although the child *might* have seen a great deal, there is, perhaps, much that he has not methodically observed, or that he has even not seen at all.

Hence we see that the principal aim of sense-perception teaching is of a methodical nature ; it is to exercise the senses and to cultivate the power of observation. But as the cultivation of this power takes place by means of material substances, it therefore does not exclude but includes the material plastic elements, namely : knowledge in regard to the phenomena considered. It is, at the same time, from these single building stones, collected one by one, that we are more easily enabled to build up later the mental structure, the idea of home. And the "mentalizing" of surrounding phenomena peculiar to our home, the combining of them into one total image, is properly the final aim of this instruction.

Teaching of local geography is not easy. On the part of the teacher it requires skillful preparation, great circumspection and patience; on the part of the pupil open eyes and close observation, even outside the school room.

Again, the pupil is to be energetic and persistent in searching out and observing for himself alone, this or that object. In this direction there are many well-adapted exercises, of which a few are here pointed out:

1. Exercises in *observation;* for example, the direction of a weather-vane.

2. Exercises in *examination ;* for example, the different squares in a city.

3. Exercises in *discovery;* for example, where there are reservoirs in a city, or springs or brooks in a country place; on what building there are weather-vanes, and what they look like.

4. Exercises in *measuring* and *counting;* for example, to measure by steps the length of a street, or width of a road, comparing distançes thus measured between any two places.

These and similar problems the pupil can work out for himself, and thereby he is forced to be observing and attentive when the teacher is not by him.

It is best to give exercises of this kind directly before the conversational lesson on the selected subject, so that the pupil may come prepared beforehand.

What means of aid have you in local geography teaching, and how do you use them? Perhaps a plenty of charts and maps. But these are the very aids which are most likely to be misused. For example, it is a misuse of them when they are used from the commencement, and when instead of the actual locality only a picture of it is viewed, so that the scholar becomes less acquainted with the locality itself than with the map of it. One can not be too strongly warned against this danger. Let this be your ruling principle: *First the object, then the picture,* so that the object will explain the picture, and not the picture the object. These auxiliary means mentioned should only be used after the perception has been gained from the reality, and after the scholar himself has drawn little sketches of it. He gains, too, so much the more pleasure from seeing, instead of his own imperfect attempt, something more perfect. In this way he comes to a right understanding of geographical maps in general, which is a great point gained for his future geographical studies.

PART I.—SPECIAL LOCAL GEOGRAPHY.

PRIMARY STEPS IN LOCAL GEOGRAPHY, BELONGING TO THE DEPARTMENT OF SENSE, PERCEPTION, INSTRUCTION.

The School-room.—(Terms of distinction—below, before, behind, right, left). Four walls, one floor, one ceiling. The walls *stand,* the floor and ceiling *lie*—ceiling above, floor below. Right wall, left wall, front wall, back wall. Four corners. Of equal size are ceiling and floor; right wall and left wall; front wall and back wall. In which side are there windows? How many? In which doors? What stands on the floor of the school-room? What hangs on the walls? How long and how wide is the school-room? (To be measured by steps.) How many seats, desks, tables stand in the room? (Drawing of the floor, or of one of the walls on the blackboard before the class.) Observation, description and comparison of various things in the school-room; for example, of doors, windows, table, slate, chalk, sponge, etc. Make drawings of some of them. In observing the windows the children are to look out and tell what they see.

The School-yard.—There is a yard to our school-house. On which side, or how many sides is it? It is long and wide. How long and how wide? (Measured by steps.) What surrounds it? What can you see standing or lying in the yard? What is the use of what you see? How do you go from the school-room into the yard? How many steps of stairs from the hall into the yard?

The Sun.—Does the sun shine to-day? Where is the sun? Does it always stand still in the same place? What does it do in the morning? In the evening? When is the sunshine warm est? How does the sun look? Does it shine every day? When does it not shine? Where does it rise—set? Point where with your hand. Say aloud: morning, *east*—evening, *west.* Where is the sun at noon? Point where. We say that direction is towards the *south.* In what direction does the sun rise—set—stand at midday? The sun moves in the sky from east to west. It does not move in a straight line, but in a curved line. (Drawing.) The direction opposite the south is called *north.* Repeat the four points of direction.

The Moon.—Can we see the sun in the sky at night? Then we see the moon and the stars. Do we see them every night? How does the moon look? Does the moon also give warmth? Does it also rise in the east and set in the west.? (Told to look at it in the evening.) Comparison between the sun and the moon.

The Stars.—When do we see the stars? Can we see them every evening? Do they look as large as the sun or the moon? How many stars are there in the sky? Are they all equally bright? Do they give warmth like the sun? Are there stars in the sky by day also?

Water.—(For a rainy day.) Look out of doors. It is raining. The rain is water. It falls in drops. How many drops are there? Where do they come from? Do the drops always remain on the ground? The rain wets? What, for example? Does it rain every day? Has it rained much to-day? How long is it going to rain? Look into the street—yard. You see the water standing there in several places; those are puddles; we will see if they are still there this afternoon or to-morrow. They are there no longer; what has become of them? We also have water here in the room; what is it in? Who brought it? Where was it brought from? (Something more about the well, pump, or water-pipes.) A glass filled with water. Properties of water observed: fluid, transparent, colorless, tasteless, odorless. Can the water be made warm or hot? How? Can't it also be made solid? What is it then called? When does water become ice? Water falls from the sky as rain; it rises out of the earth; but it also flows on the surface of the earth. Do you know any large body of water near us?

Clouds.—Look out of doors. What is the sky covered with? How do the clouds look? Are they solid? Towards what direction are they moving? When it rains, snows, or hails, are there always clouds in the sky? Rain does not fall from all clouds. What is the color of the clouds we now see? What other colors do we sometimes see in clouds? What colors do we usually see in the clouds at sunrise and sunset?

Wind.—How do we perceive the wind? Can we see it or hear it? What is the wind? Strike the air with your handkerchief, you feel a blowing—that is wind. East, north, south, west wind. What do we call a very strong wind?

Rainbows.—You see a rainbow in the skies. It is of different-colored stripes. There are seven of these: a red, an orange, a yellow, a green, an indigo, and a violet stripe. The red is on one edge, the violet on the other edge, and the green in the middle of the rainbow. When our face is toward the rainbow, the sun is behind us. We can sometimes see the color of the rainbow in a water-bottle, in the water of a fountain, or in water falling over a mill-wheel. (The teacher will find it an advantage to have strips of paper of the seven colors, and exercise the children in arraying them in proper order; the child thus early acquires a correct knowledge of colors.)

The School house.—When possible, observe all four walls from without. How many windows? How many rows, one above the other? (Stories.) What is the shape of the windows? Of what are the walls made? The roof? How many chimneys? Is there a door in the side of the building? What else is there on this side? On which side does the sun shine in the morning? In the afternoon? On which side does it shine little or not at all? East, west, north, south sides. What is within the school-house? Hall, class-rooms, etc. How many class-rooms? Who can tell me of any other school-house in the city or town.

Classes and Teachers in the School.—What is the name of our school? You are all in one class; which class is this? How many classes are there in the whole school? This room is our class-room. Is it on the ground floor or first story—in the second story, or third? Comparison may be made between the school-house and some neighboring building.

The People who Build Houses and what Materials They Must Have.—In building a house the following people work: masons, carpenters, locksmiths, glaziers, roofers, plasterers. What do the masons do? The carpenters? etc. What do the masons use? The joiners? What parts of the house are built of stone? brick? wood?

Snowy Day in Winter.—Look out of doors. What is falling from the sky? That is snow, and we say it falls. Does the snow fall in drops like water? It falls in flakes. It is white. It remains lying on the ground. When the weather becomes warmer the snow melts; then it becomes water. Why does it snow in Winter and not in Summer? What do boys do with snow? Can we ride on the snow? How can we ride on the snow?

Ice.—It is very cold out-of-doors; it has frozen. The water is covered with a sheet of ice. Does the ice fall from the sky like snow? Why does not water become ice in Summer?

People who Furnish us with Food.—Butchers with meat, bakers with bread, millers with flour, gardeners with vegetables and fruit, grocers with sugar, salt, coffee, etc., fishermen with fish, brewers with beer, etc. Particulars in regard to each; for example, where does the butcher get his meat? From the cattle that are slaughtered. What animals are slaughtered? Where are they slaughtered? Where in the city do we find meats for sale? Where are vegetables raised? Where sold? Name vegetables you have seen in the market. Conclusion: What food do we obtain from animals—what from plants?

People who Furnish us with Clothing.—Who provides you with your clothing? Do your parents make it themselves? Of whom do they get your clothing? To make clothing we must first have something of which to make it. Of what do we make clothing? In what kind of stores do we buy materials to make clothing? Name some of the stores. We can also buy many kinds of clothing ready-made; name such garments. Clothing must be kept clean; shirts, stockings, etc., often washed. Laundries.

Care of Health.—Who of you has ever been sick? Whom did your parents send for to make you well again? What did the doctor do when he came? Where did the doctor come from? Where is there an apothecary? When you were sick you staid in the house and your parents took care of you; but is there no place for people who are sick and have no home to stay in, and no one to take care of them? Have you ever seen a hospital? where? Do you know of any other hospitals?

Trade.—Many people who buy things to sell, have stores; these people are called merchants, traders, storekeepers. Tell me some stores near where you live. (Signs, firms.) What do we buy in a grocery store? In a clothing store? To buy we must have money. Coins and paper money. (Show different coins.) Of what metals are coins made? What is the building called where money is made? Did you ever see a mint? where? what kind of a building? What banks do. What brokers do.

Street where the school is situated.—On what street is our school? It is long and wide; how many steps wide? How long? Is it straight or somewhat crooked? Is it level or somewhat hilly? (The general direction in which it runs.) Is it planked or paved? How many stones does it take to pave a street? They cannot be counted. The middle of the street is higher than the sides; why? The water runs off in the gutters; does it run up or down? On both sides of the street are narrow walks for people; these are called sidewalks. In the streets we meet carriages, men and animals; what kind of animals? On both sides of the street stand houses; there are two rows of them; see if there is anything else to be seen in the street. Posts—on top of the posts, lanterns—within the lanterns, lights. The streets are lighted at night; why? We find trap doors of wood or iron in the streets; what are they? Conclusion: ask individual scholars, on what street they live, through what streets they come to school.

Different kinds of Carriages seen on the streets.—Names of different vehicles. Difference between a car and a carriage. Name different parts of a carriage.

Public Squares or Parks.—Where is the nearest public square? How many steps long is it? What is in the square? What is it for? (Drawing.) Other squares or parks.

A Ranch or Farm.—A ranch or farm is a large place, and on it we find many things; wagons, wheelbarrows, plows, harrows. We also see many animals—hens, ducks, geese, etc. There are also many buildings. There is a dwelling house; there is another building with large doors and no windows; that is a barn where hay and grain are kept; sometimes there are places for the horses and cattle in the barn; sometimes there are sheds near for them. There are cows and calves, oxen, horses and swine. What are all these animals for? The cows are to give milk, the horses to draw the wagon and the plow, the oxen and the swine to be fattened for slaughter. The oxen must also draw the plow, harrow, etc. There are also many people on a ranch; boys, girls and laborers. What do they do? They have to feed the cattle, to milk the cows; (what is done with the milk, who takes care of it, and what we call the place where it is kept;)

they have to manure the fields, to plough the ground, to sow seed, to harvest and thresh. We call such people *farmers* and their work *farming* or *cultivating the soil.*

Fields.—Plow-land, tilled land or field is land that is plowed every year once or several times. The land is ploughed with a plow; the plow cuts the surface of the earth into narrow strips and turns them over; the cuts or hollows made are called *furrows.* The earth must not only be plowed but harrowed also; the harrow covers the seed with earth, and breaks up the clods. The seed is sown either with the hand or with a sowing-machine. The seed that is sown is not to lie in the earth, but to spring up, grow, and bear fruit. The field is manured in order to make the seed vigorous and healthy. Kinds of seed sown. Harvesting, season and manure.

Neighboring Bodies of Water, (rivers, bays, lakes, etc.,) Bridges, etc.

A River.—The *name.* The water of a river flows in a hollow channel of earth; and this hollow is called the *bed* of the river; the borders of this bed, that is, the land at each side of the river, are called the *banks* or *shores* of the river. The river is as *wide* as the distance from one of the banks to the other; if there is a bridge across the river we can tell how wide the river is by measuring the bridge. The river is also *deep* as well as wide; its depth is the distance from the surface of the water to the ground below. The ground at the bottom of the river is uneven, like the ground around us, so that in some places it comes nearer to the surface of the water than in other places; of course the water is not so deep in such places, and these are called *shallows* or *shallow water;* places where the water is so shallow that we can wade across or cross with a horse, are called *fords.* Sometimes the bed of the river is so hilly that the tops of these little hills rise above the surface of the water; these hill tops are entirely surrounded by water and are called *islands.* A river has not always the same width and depth; when there is but little or no rain for a long time the river is narrow, more shallow and the water more clear; in heavy rains, or after heavy rains, the river becomes swollen; that is, it becomes wider and deeper; it rises higher in its bed and the water becomes less clear. Sometimes the bed of the river becomes so full that it can not contain all the water of the river; the water then rises above the banks and flows over the land; we then say the river has overflowed its banks, or has flooded the country. When the weather in winter is cold enough, the surface of the water becomes frozen and forms ice; sometimes the ice is so thick that people can walk and skate upon it; sometimes the water freezes to so great a depth that the ice becomes thick and strong enough to bear heavy loaded teams. What kind of animals live in the river? What use do we make of the water in the river?

Shipping (*vessels and boats*).—There are several kinds of vessels in which we can travel on the water. (Examples. A general description of the shape and different parts of a vessel, but no details.) People whose business it is to sail vessels on the water are called sailors, boatmen, etc. The forces which move vessels are the currents of water, steam, horses, wind and the human hand. The means through which the forces work are steam engines, ropes, sails, masts. Different ways of traveling. Which is the easiest—quickest—slowest—why? Ships are usually loaded with different things, viz.: wood, stone, coal, wheat, etc. This is called the *cargo* of the ship. A *wharf* is a place on the shore or bank of a body of water, to which vessels can be made fast, while they lade and unlade their cargoes. Places near the water, where vessels are built or repaired, are called *shipyards*.

Bridges, (*railroad and river bridges*).—For what purpose are bridges? Of what built? Difference between a railroad bridge and one made for teams and foot-passengers. How supported from below. How ships pass through a river bridge.

A Railroad.—A railroad is a road built of iron rails; there are two rows of these rails, and they are at all points equally distant; these two rows of iron rails are called the track. The carriages which roll on these tracks are called *cars*; several cars joined together are called a *train*; at the head of a train is a steam carriage, which we call the *locomotive*. The locomotive moves by means of steam from boiling water, and when the locomotive moves it draws the train with it. There are *passenger* trains and *freight* trains; express trains and accommodation trains. (Explain difference.)

Journey on a railroad.—Who of you has ever made a railroad journey? What railroads did you travel on? Let us imagine or play that we are going on such a journey. Some one may tell me what railroad we will go on. Way to the railroad station. Where? Buying tickets. Waiting in depot. Signal for taking our seats in the car. People whose business it is to take care of the train: conductor, brakeman, engineer, fireman; their duties. Signal for starting. Motion of train first slow, gradually faster. How to stop train. Places where train stops called *stations.*

SEVENTH GRADE.

PART II.—HIGHER LOCAL GEOGRAPHY.

By means of the preceding instruction in local geography the children have not only cultivated their faculty of sense-perception, but have also acquired a knowledge of many local facts and various phenomena. In accomplishing this no systematic method has been followed, but the most favorable opportunities for observing separate phenomena, particularly such as are transitory and fleeting, have been improved. The seasons of the year have here greatly served as guides. Also, in groups of similar objects, one has been selected as a representative of all for observation and study; for example, one street, one public square, one church, one body of water, etc. In this way the child has been led to perceive and take cognizance of the essential characteristics of all such objects.

But, in its higher steps, local geography can no longer occupy itself with the consideration and description of single objects; it has rather to endeavor to bring to view order in the manifold and varied forms and phenomena in the world of home, by associating and grouping together things similar in nature. In no other way would it be possible to accomplish the final task of local geography, viz., to create a complete mental picture of the locality studied, and its various features and phenomena.

Hence it now follows that instruction in local geography, in its advanced steps, must follow a fixed system, which is quite foreign to the nature of sense-perception instruction. The reviewing in the third year of much which has come under notice in the primary steps of the study, will be but more conducive to the accomplishment of this purpose.

As an object of instruction, divide the subject into two parts:

1. Its changing and changeable phenomena, or the department of observation.

2. The fixed and unchangeable features, the department of consideration and reflection.

The two parts of the course of instruction do not succeed one another, but rather the first mingles itself incessantly with the second, in every season of the year. It comprises, chiefly, phenomena of the sun, moon, stars and atmosphere. Let us draw nearer to this matter.

1. The Locality of Home in its Changing Phenomena—Department of Observation. *a. The Sun.*—In the heavens we see the sun by day, the moon and stars by night. Always? Do we not often see the moon by day also? These, together, are called the heavenly bodies. The sun appears to be the largest among them; it moves from east to west, in a curved line, bending towards the south. From morning to noon-day it ascends; from noon to evening it descends. The highest point reached is at noon. In the sunshine all non-transparent bodies throw a shadow. Observe the shadow of such a body—your arm, for instance—at morning, noon and evening, taking notice of its direction and length. Result: the shadow always lies in the direction opposite to the sun—in the morning toward the west, at noon toward the north, at evening toward the east. It is smallest at mid-day, largest morning and evening. From morning to noon it decreases gradually in size—from noon to evening it increases. It describes a curved line from west to east, bending toward the north, in a manner directly opposite to that of the sun. Repeat these observations and descriptions frequently in the course of the year. At different times mark points of rising and setting of the sun; also, its height at mid-day. The days of Spring and Autumn, as well as of Summer and Winter,

are not to be allowed to pass unnoticed. At last we shall reach this result: The sun does not always rise and set at the same points on the horizon. At the beginning of Spring and Autumn it may be said the sun rises exactly in the east, and sets exactly in the west; these points are to be marked—also the time of rising and setting. Till the beginning of Summer it rises and sets continually farther and farther toward the north. It also rises continually earlier and earlier, and sets later and later. At mid-day it ascends continually higher and higher—the shadow becomes shorter and shorter. The line it describes is always an increasing curve. From the twenty-first of June all this is reversed. On that day the sun rises furthest at the northeast, and sets furthest in the northwest. That is the day of its earliest rising and latest setting; at noon of that day it reaches its highest point in the heavens; the shadow of the body is then smallest; the curve the sun describes in the heavens, the largest. Continuing observations of this nature, during the remaining part of the year, and especially at the beginning of Winter, similar facts will be developed in regard to the sun's rising and setting, the height and length of the curve it describes, length of shadow at noon-day, etc. The tropics can here be well explained. Difference of temperature at different parts of the day, and at different seasons of the year.

b. The Moon.—Observations of the moon are best commenced in some month of Autumn and Winter; they should be continued through the whole month, from one full moon to the next. Result: The moon also rises in the east and sets in the west, but not always in the same place. Neither does it rise every day at the same hour, but each day later. Its form is not always the same, but changes every day, sometimes growing larger, sometimes smaller; when the whole disk is lighted we say it is *full moon;* when it has decreased to one-half we call it the *last quarter;* when we cannot see it at all because it rises and sets with the sun we say it is *new moon;* when it has again increased to one-half we say it is the *first quarter.* In the last quarter we see the *left* half lighted, in the first quarter the *right* half. How does the crescent form appear by the increasing light, how by the decreasing light? (Drawings.) When the moon is on the increase we see it evenings; on the decrease, mornings. The full moon shines the whole night. The new moon is in the heavens the whole day, but invisible. How many days from the full moon to the last quarter? From the last quarter to new moon? From the new moon to the first quarter? From the first quarter to full moon? How many, therefore, from full moon to another? (Should an eclipse of the sun or moon occur, observe and remark upon it.)

c. Observations of the Stars.—Here we have not to go beyond a few constellations and the position of one or another planet. In the constellations no change in the position of the stars to each other, is perceptible: they remain throughout the year in the same relative position to each other. Not so with the evening-star or morning-star, which is sometimes near one constellation, sometimes near another. The morning-star or evening-star is a planet, a wandering star. The constellations best adapted to observation during the whole year are the Greater Bear and the Lesser Bear; in Winter, Orion. (Drawings.) At different times of the year both constellations to be observed. Final result: The terminal star of the straight shaft of the Lesser Bear (Urso Minor), is always in the sky, and always at the same point in the sky. It is called the Polar Star. The Greater Bear is always in the sky, but not always in the same place; it revolves around the polar star. In Winter attention to be directed to Orion. (Drawing.) After observing Orion at 7 o'clock and again at 9 o'clock—was it still in the same place at 9 o'clock? It was further to the right and the west. Had we looked again still later we should have seen it set in the west. Stars that set also rise again. Orion, like the sun and the moon, rises in the east and sets in the west. It describes an arc in the heavens, as do also many other stars. The Greater Bear and the Lesser Bear, on the contrary, as also the other stars near them, do not rise and set. They describe no arc in the heavens but a complete circle. Observe again this evening at 7 o'clock the point where Orion stands; we will look at it again in three or four weeks from now, and see if it still stands in the same place at the same hour. It will be seen that it has gone farther towards the west. At last it will be seen to set at 7 o'clock in the evening, and still later will no more be seen at that hour. The constellation of Orion is not always in the sky at night; in winter we see it, in summer we do not see it. The same with many other stars. The sky of night does not display in winter all the stars of summer, nor in autumn all those of spring. Observations of Sirius and of the Pleiades, may be made together with those of Orion. If we draw a straight line through the belt of Orion, continuing it in a southeasterly direction, it will reach a large, brilliant star named Sirius; it and the stars near it, compose the constellation Canis Major. Large bright stars like Sirius are called stars of the first magnitude. The stars of the Ursa Major are less bright, and hence are called stars of the second magnitude. What do you think of the stars of Orion in regard to their brightness? Westward from Orion is seen a thick cluster of stars; these are named Pleiades. We sometimes call them a flock of wild pigeons flying from the huntsman Orion; every night one of them is killed, but in the evening we see another in its place. There are many other constellations in the heavens, besides those already mentioned; you will learn them hereafter.

d. Observations of Weather.—A weather-vane in the vicinity of the school-house is to be used as an aid. A manuscript book is to be prepared, and for eight or ten days is to be used in turn by the best scholars as a note-book. Herein is to be written each day, besides the direction of the wind, other phenomena also; for example, that it has rained, snowed, hailed; that the sky has been clear or cloudy; that it was warm or cold, etc. At the end of a certain time, perhaps a month, a summary is to be made: so many clear days, so many cloudy days, so many rainy days, etc.: a certain wind prevailed. Result: The weather is not the same every day of the year; it changes continually; the sky is sometimes bright, sometimes cloudy; the wind has not always the same direction and force; when it comes from towards the north the weather is clear, when it veers toward the south we may expect rain. Here is an opportunity for explanation of the word climate, of the phrases temperate climate, healthy climate, etc. Observations of snow on mountains in sight, while there is none in the vicinity, may be made to illustrate the greater cold on highland than on lowland; also observation of smoke ascending from chimneys to be made in determining the direction of the wind.

2. THE LOCALITY OF HOME IN ITS UNCHANGEABLE FEATURES.—*Department of Consideration and Reflection.*—It is impossible to make the division of the phenomena to be observed entirely distinct; the department of reflection and consideration must comprise much that is not fixed and unchangeable; for instance, animated nature as represented in the animal kingdom. Life is motion, and all motion to be learned must be observed. Since, however, the animal kingdom, in its motion and activity, and the vegetable kingdom in its development, belong to a fixed locality, we, therefore, in this case, combine observation with consideration and reflection. For convenience we shall select San Francisco for illustration of this department.

a. General View of San Francisco.—The place where we reside, where our school-house stands, is named San Francisco. San Francisco is called a city. A city is an incorporated town governed by a Mayor and a Board of Supervisors or City Council. San Francisco is situated on the west side of San Francisco Bay; directly opposite, on the eastern shore, is Oakland; San Francisco also lies on the southern shore of the Golden Gate; Saucelito is situated on an inlet of the opposite northern shore, and lies a little west of north from San Francisco.

b. Streets.—The city contains many streets. Each of you may tell me the name of some street. Market street is one of the longest and widest; its commencement is at the water's edge, about two-thirds of the distance from Meiggs' Wharf to Rincon Point; from there it extends in a straight line, its direction being northeast and southwest. Most of the streets lying north of Market street run at right angles to each other, their direction being nearly north and south, east and west; south of the line of Market street, the streets run in various directions and at various angles. Market street is one of the business streets of the city. Let us see how many different kinds of business located on Market street you can mention to me. What public building? What other large buildings? Van Ness Avenue is also a very wide street. It commences at Market street and extends to the water's edge, which it reaches in the vicinity of Black Point. Van Ness Avenue runs north and south, and Market street northeast and southeast, it therefore lies in a diagonal line to Market street. Does it then form a right angle with Market street? Can you tell me what kind of buildings we find on Van Ness Avenue? Is it a business street? Point Lobos Avenue is another very wide street; it commences at Laurel Hill Cemetery, or Lone Mountain, and extends in a westward direction to the Pacific Ocean, which it reaches just south of Point Lobos; Point Lobos forms the southwestern boundary of the Golden Gate. Point Lobos Avenue runs in an easterly and westerly direction; is it then parallel to Van Ness Avenue? To Market street? How many of you have been on Point Lobos Avenue? Did you see as many business places as on Market street? As many private residences as on Van Ness Avenue? Did you meet any heavily loaded business teams? What rocks are in the Pacific Ocean opposite the end of this road? What animals live on these rocks? Front street, Battery street, Sansome street, Montgomery street and Kearny street, all run from Market north towards the water, in the direction of North Point near Meiggs' Wharf; they all run in a northerly and southerly direction; (drawing) the lines which separate them are parallel lines, and hence we say these streets are parallel to each other. Each of you may tell me of some place of business on either of these streets. Are these business streets? (Each scholar should give the name of the street on which he lives, and the directions in which it extends. Also, the direction at 12 o'clock M. of the shadows in any given street if they fall in the same direction as the street, then the latter must extend north and south; if, on the contrary, they fall upon one side, then the street extends rather in an easterly and westerly direction; very narrow streets extending in the latter direction will lie wholly in shadow at noonday. The chief aim of this exercise is to enable the learners, wherever they may be, to recognize the cardinal points.) There are so many streets in the city that we can not name them all; some are long, some short; some wide, some narrow; some straight, some crooked; some are called places, courts, or alleys; these are generally shorter and narrower than most of the streets, and some are closed at one end. What can you tell of the different kinds of paving with which the streets are covered? Of what use is it to pave the streets? At night the streets are lighted with gas; where does the gas come from? In summer some of the streets are watered; why?

c. Public Squares.—There are several of these in the city. Who can mention one? another? Many of you have seen Portsmouth Square. It is surrounded, or bounded, by Brenham Place, Washington street, Kearny street and Clay street. As many of you as can do so, I wish to visit this square, and tell me on which side (north, south, etc.) each of these streets lies, and, also, how many steps the square measures. (It is better, instead of Portsmouth Square, to select the square nearest the schoolhouse for the first lesson; for the second, for each child the square nearest his own home, or one which he must pass on his way to school, and others afterwards. Let the pupils bring in drawings of these squares, representing the measurements they have made, accompanied by written descriptions, always insisting upon the cardinal points being indicated, and this from their own observation.) Among others you have mentioned the Golden Gate Park. This is in the shape of a parallelogram, half a mile in width, and over three miles in length; it contains about one thousand acres; its longest extent is from east to west, while its width of one-half a mile extends from north to south. It lies in a westerly direction from the new City Hall; its eastern border is a little less than two miles distant from the City Hall. The Golden Gate Park is bounded on the north by D street, on the east by Stanyan street, on the south by H street, on the west by the Pacific Ocean. It is to be entered through an avenue two hundred and seventy-five feet in width, and four-fifths of a mile in length; the eastern extremity of this avenue is less than one mile west of the new City Hall. The western three-fourths of the Park is, at present, drifting sand; the eastern one-fourth is arable land. It is divided by several ridges of hills, some of which rise about two hundred feet above the average level of the Park, and four hundred feet above the level of the ocean.

d. Sketching of a Map of San Francisco.—The pupils have already been required to draw simple maps, representing the location of the school-house, of their own homes, and of public squares, and other places in the city. They have observed that in every drawing of a map, south has always been opposite to north, east to west. Their maps should always be made with a cross indicating the four points of the compass; when drawing upon the blackboard, however, it is well to exercise them in varying the direction of the cardinal points; for example, while one has north indicated by the top of the blackboard, the next one may have it represented at the right, the next one at the lower part of the blackboard, the next one at the left, and others may represent it at points diagonal to these; this, however, must not be done till after they have had sufficient practice not to become confused in the general rule that, on maps, north is represented by the upper part, south by the lower part, east by the right, and west by the left. The following method of sketching a map of San Francisco is given to illustrate the general plan, and is by no means offered as the best plan of arrangement. First, draw a cross representing the four cardinal points. In the middle of the quarter which represents the northeastern part of the space allotted to the whole map, draw a dotted line from northeast to southwest; as Market street runs a little east of northeast, and a little west of southwest, draw another line intersecting these at very acute angles; now erase the first line and leave the second line to represent Market street. In the middle of this line make a large dot to represent the new City Hall; now draw a small right-angled triangle at the north of Market street, making the dot the centre of the hypothenuse; the streets drawn may now be named, and the City Hall Park thus bounded: on the north by McAllister street, on the northeast by Jones street, southeast by Market street, west by Larkin street. Larkin street may now be extended northwards, its northern end indicating the vicinity of Black Point. Continue Jones street in a line parallel to Larkin street, the two intermediate parallel streets being indicated by lines, and their names learned. Now, extend Hayes street in a westward direction from the southwestern angle of City Hall Park. Next, draw Van Ness Avenue a little to the west of Larkin street, and parallel with it, beginning at Market street, crossing Hayes street at right angles, and terminating it also in the vicinity of Black Point. Passing westward at a right angle from Van Ness Avenue, we come to Park Avenue, which leads to the parallelogram ·representing Golden Gate Park. A little north of the western end of the Park we find the Cliff House and Seal Rock; a little further north, Point Lobos. North of Park Avenue we will locate the Masonic, Odd Fellows', Calvary, and Laurel Hill Cemeteries. Fort Point a little further north than Black Point, northwest from Laurel Hill Cemetery, and northeast from Point Lobos; directly south of Fort Point is the Presidio. Let us now return to the Cliff House, and ride along the beach till we come to the Ocean House road. This road runs nearly east from the beach until we have gone some way beyond the Ocean House; it then turns to the southeast till it brings us to the Industrial School; here the San José Railroad, coming from the south, crosses this road opposite the Industrial School, and here we will take the cars, and wind along in a northeasterly direction, till we reach the San José depot on Townsend street, between Third and Fourth streets. On our way in the cars, when we had rode about one-third of the distance, we passed St. Mary's College at the right and east of the road; at about three-fourths of the distance rode in the cars, we passed the Jewish Cemetery at the left and east of the road; and half way between the Jewish Cemetery and the Market street depot was the old Mission Church—this church is also half way between the railroad on the east and Market street on the west. We will now locate the Alms-House by drawing a straight line northwards from the Industrial School to the eastern end of the Golden Gate Park, and on this line, half way between the Industrial School and the Golden Gate Park, we will make the site of the Alms-House. We will next locate the City Hospital, which lies in a nearly easterly line from the Alms-House, east, also, of the San José Railroad. Let us now return to the junction of Jones and Market streets, the northeast boundary of City Hall Park. Continuing our way through Market street in a northeasterly direction, after passing six blocks, we come to the first large business street that runs north and south; this is Kearny street, and we will represent it by a line running parallel to Van Ness Avenue, Jones and Larkin streets. Kearny street is a long thoroughfare, and we will walk along it the distance of eleven blocks, when we find the street crossed at right angles by Broadway, which runs east and west; turning to our left we see the City and County Jail, on the north side of Broadway, a little distance from Kearny. Now, locate and name streets east of Kearny, and parallel to it. Locate and bound principal public squares. Names, in their order, of the streets between Kearny and Van Ness Avenue, etc. The location of school-house should have been noted as soon as it could be indicated by the outlines drawn; each child should also be required to locate his own residence on the map drawn by him. Of course each teacher will select additional points of importance, guided, somewhat, by the degree of interest this or that place may have for this or that class. Any map of San Francisco may be used as a first guide and aid in these lessons.

e. Water Used in our Houses and in the City.—We obtain the water which we use in our houses in two ways: first, from wells and springs out of which we usually pump the water; second, from pipes which carry the water into or through our houses. By the latter method there are always several large reservoirs, into which large quantities of water are conducted by pipes or flumes, and from them are subterranean pipes leading to various parts of the city. In some houses the water flows freely through pipes to the upper stories without the aid of a force-pump. Can you tell why? The water which flows in subterranean pipes is also used in extinguishing fires. There are certain places to which the hose of the fire-engine can be attached, and then water flows through the hose and is thus thrown upon the burning building. Who has ever seen the hose thus attached? How can these hydrants be distinguished? Water which has been used, and also rain water, is conducted away in the same manner as pure water is brought into and through the city; the subterranean passages through which the waste-water flows are called sewers. The springs from which we obtain water for domestic purposes are springs of pure water; there are also other springs, the water of which is impregnated with certain minerals, as sulphur, etc. These springs are called mineral springs, and the water is considered beneficial in the cure of various diseases. Besides the mineral waters from natural springs, we have also manufactured mineral waters. Can you mention any mineral springs in this State? Where situated?

f. Buildings in the City.—(San Francisco taken for illustration.) The houses in which people reside are called *dwelling-houses.* Are there any houses in which people do not reside? Name such. Houses belonging to individuals and adapted to the residence of but a few persons, and not occupied for business or trade, are called private houses; houses belonging to the city or to a society of individuals, are called public buildings; such are the City Hall, County Jail, theatres, churches, school-houses. Dwelling-houses may differ from each other in height and in size; they vary in height from one to several stories; how many stories high is the house in which you dwell? Our school-house? Some houses that we can see from the window of the school-room? Some houses have neighboring buildings belonging to them, that are used for cattle, carriages, etc. Name some such house. In the city most of the houses are numbered. In San Francisco the City Ordinance makes Market street the starting-point for the numbering of all streets leading from Market street, in either a northerly, a south-easterly or a westerly direction; the streets laid down on the official map of the city as forming the water-front thereof, are made the starting-point for numbers on all streets running westerly and southwesterly therefrom; on all streets the numbers on the right hand side, starting from the point of beginning, are even numbers; on the left hand side, odd numbers. One hundred numbers are allotted to each block, fifty on a side; thus the numbers between one hundred and two hundred would be found in the second block bounded by principal streets; every number between two hundred and three hundred would be found in the third block bounded by principal streets, and so on. For each number there must be at least twenty feet frontage allowed. Can you tell me when we find two main entrances within twenty feet, how the houses are then numbered? In some streets, from their being partialy opened or cut through, or from some other irregularity, the numbers do not conform to the arrangement established by law. What is the number of the house where you live? Is there an odd or even number? Is your house then on the right or left side of the street starting from the beginning of the numbers? Here a useful exercise may be made by selecting streets the numbering of the houses in which corresponds to the requirements of the City Ordinance, and requiring the pupils to tell in which *block* of said street a certain number will be found, on which *side*, where the street begins; what streets, in their order, divide the block; and hence, in what street said number will be found. In some cities are houses that have been built a hundred or hundreds of years; these appear quite different to the eye from modern houses; in San Francisco, however, we have but few old houses, and none so old as many eastern and European cities have. Why? Of what are the very oldest houses in this city built? With what are the roofs covered? How many of you have ever seen such a house?

g. Manufactories.—Who of you has ever seen a manufactory or a factory? Where? What was made there? Let us see how many others we can name, telling where situated and special manufactures. In a factory there are a large number of workmen employed. They are usually aided by machinery. Some of these buildings are very large and have high chimneys; can you name any such?

h. Churches.—What church is nearest to our school-house? In what direction from it? Do all the people in this city go to this church? *Different Churches.*—Protestant, Catholic, Hebrew or Jewish. The Hebrew or Jewish church is called the Synagogue. The word *church* means *the Lord's house*; the word *synagogue, a collection of people*, or a *place where people collect.* Mention as many churches and synagogues as you can, and tell where they are situated. Mention different parts of the church building; for example, vestibule, nave or body of church, aisles, choir, chancel, gallery, vestry, tower, steeple, etc.

i. School-houses.—Name and location. Grammar schools; high schools; primary schools; public and private schools; institutions for the deaf, dumb and blind. Besides the above named buildings notice hospitals, theatres, libraries, Post-office, Custom-house, and others, giving location, and purposes for which they are used. We sometimes see the American flag raised on public and private houses; on some private houses there is often some foreign flag raised, and on the front of the house the national coat-of-arms of the same country; whom would we expect to find dwelling in such a house? Can you tell me any of the duties of a consul?

j. The Fire Department.—However securely a city may be built, it is always subject to one great danger—conflagration. In order to extinguish such fires as soon as possible, and whereever they may break out, the people of cities unite in means of protection. In different parts of the city we have engine-houses; in these, fire engines and other implements for extinguishing fires are kept. Can you tell me where there is one such house? Besides these engine-houses there is one central office where watch is continually kept, day and night. From this central office a telegraphic apparatus connects with signal-boxes in various parts of the city, and also with the different engine-houses. The signal-boxes are always kept locked, but, on the discovery of a fire, the box nearest the fire is opened and the signal communicated to the central station; from here the watchman immediately strikes on the alarm bells the number of the district where the fire is; the same apparatus which strikes the alarm at the same time strikes also the alarm gongs which are to be found in every engine-house. In looking over the numbers of the signal stations we find certain numbers omitted; for instance, 20–30–40, and so on; also, 11–22–33, etc.; why are these numbers omitted? In which fire district is our school-house? the house where you live? From 1849 to 1851, San Francisco was devastated by six great fires, in which property valued at many millions was destroyed. These frequent and destructive conflagrations were due in a great measure to the materials used in buildings at that early day of the city's existence, they being, in great part, composed of thin lumber, canvas, paper, and cloth; also, to an insufficient supply of water, and a less efficient and well organized fire department than is now established. That people may not suffer loss by fire, Insurance Companies are established; these, on payment of a certain sum of money, agree to pay to the loser the value of the property destroyed. Houses, furniture, and merchandise are thus insured. We often see on a house a small plate or sign, bearing the name of some insurance company; why is it put on the house? Who of you have ever seen such a plate?

k. Inhabitants of a City.—1. Animals.—There are many people dwelling in a city, but, besides these are also many animals. Let us first speak of the latter. Many of these are of use to man; they are sheltered, fed and cared for by man, such are called domestic animals. Here mention of some to be made and some qsestions in regard to their form and appearances; then questions like the following: What people use horses? For what do they use them? In the city we see many horses but few oxen, cows, calves, swine or poultry; all the latter we usually find in greater numbers outside of the city. There may be many oxen, calves and swine and much poultry brought into the city, but only to be slaughtered. Name different domestic animals and the special use to which each is put. Some animals are also merely for our amusement; for example, some kinds of dogs, birds, as canaries, parrots, mocking-birds, etc.; also gold-fishes. There are places of amusement for the public, called zoological gardens; these contain a collection of a great variety of animals. Who of you have ever been in such a garden? Name some of the animals you saw. Many of these are brought from foreign lands; the men who take care of them are called their *keepers*, and they feed the animals and take care of them. These animals are kept not for mere pleasure, but also that we may see and learn about the animals of foreign lands. There are also many animals at large in the city who find food and shelter for themselves; for instance, birds, rats, mice, flies, etc. 2. *People Dwelling in the City.*—The most important inhabitants of a city, however, are the *people* who dwell in it. In San Francisco, in 1872, there were 178,276 inhabitants; of these 5,000 were what is called a floating population, that is, they have no permanent homes in the city, but live in hotels, hospitals, alms-houses, etc.—or they call San Francisco their home, but spend most of their time making short voyages along the coast, bay or rivers. Counting the number of people in the city, county, country, etc., is called "taking the census." This is a very old custom among nations, for we read in the Bible that the ancient Hebrews and their families were numbered by sex and age; and the most ancient record of a census that we possess is the enumeration, by Moses, of the people in the wilderness. The inhabitants of a place differ in age, wealth, religion, etc. According to age, they are divided into adults, and those who have not yet reached the age of eighteen or twenty-one years. Are you an adult? In regard to wealth, we find people of every degree, from extreme and helpless poverty to immense wealth. The rich have to help provide for the poor; this they do partly by the taxes which they pay to the Government, partly by establishing charitable and other societies, and also in more direct ways. When you no longer go to school, each of you will find something to do among your fellow-men; for instance, what will *you* do? and you? etc. Thus each of you will follow some calling, that is, some pursuit, business or profession—a certain department of labor by which you will support yourselves and acquire property. The wealth which one possesses is called his property. Some of you will become farmers; where will those live, and what will they do? Some will become mechanics; tell me some things which a mechanic makes. Some will be manufacturers; how many kinds of manufactories can you name? There are also many tradesmen or merchants, who buy and sell various kinds of wares and goods. A trader or merchant usually has on the outer wall of his store a sign, on which is his name and the kind of goods he buys and sells. Often two or more persons unite in some business; this is called a partnership, and their names together is called the name of the firm or house. Merchants have others to assist them, and these are called clerks, book-keepers, cashiers, etc. A city where there are many merchants is called a commercial city; where there are many manufactories, a manufacturing city. Besides mechanics and merchants, there are also many other people—painters, musicians, singers, physicians, municipal officers, clergymen, lawyers, teachers, etc. Many people work the whole year in the streets;

these are coachmen, teamsters, and other drivers, etc.; others work in gardens and are called gardeners; and still others work on the water as fishermen, boatmen, etc. All the kinds of business we have mentioned are usually followed only by men. Women also have to work to support themselves and to acquire property; let us see how many kinds of business are usually followed by women. The inhabitants of a city also differ in religion; there are Protestants, Catholics, and Hebrews or Jews. These different churches have schools to which children go once a week; what are such schools called? Are the pupils taught the same things that they learn in their day-schools? Some of these churches have day-schools also for children; can you tell me where there is one such school? Besides the inhabitants who have their home in any certain place, there are also people who come to that place to remain for a short time, sometimes for business and sometimes for pleasure; what accommodations are provided for these people whom we call travelers? Let us name several hotels and tell on what streets they are situated.

l. Relation of Individual Municipalities to the Whole Country.— As the different classes in a building constitute together one school, so a city and the surrounding towns and country constitutes a county; many counties are united in one State; many States united form our country. For the government of every *City* there is a Mayor and common council, board of aldermen or supervisors; of every *State* there is a Governor and Legislature; of the *Country* the President and Congress. These officers are chosen from among the people once in a certain number of years. The Mayor of a city dwells in the city; the Governor of a State in the capital city of that State; the President of the country at the National Capitol. Who is the Mayor of our city? For how long is the Mayor elected? When was the present Mayor elected? When will his term of office expire? What city is the capital of the State in which we live? Who is President of our country? For how many years is the President elected? When does his term of office expire? What city is the National Capital? Where is it situated? How far and in what direction from us? For the government and good order of cities, counties, states and country, much money is needed; this money is furnished by *taxes* which are paid to the government by the people; the rich have to pay large taxes, while the poor have but small taxes to pay.

SIXTH GRADE.

PART III.—FINAL STEPS INTRODUCTORY TO THE STUDY OF GENERAL GEOGRAPHY.

History.—San Francisco, the capital of San Francisco county, is in latitude 37° 46′ N., longitude 122° 23′ W. It is built chiefly in the northeastern part of a peninsula lying between San Francisco Bay on the east and the Pacific Ocean on the west. The peninsula is eighteen miles wide at its base and six miles wide at its northern point.

San Francisco Bay lies between Contra Costa and Alameda counties on the east and San Francisco and San Mateo counties on the west. On the south it touches the northern point of Santa Clara county, and on the north a narrow strait, three miles in width, connects its waters with those of San Pablo Bay. It is about fifty miles long and eight miles wide. It communicates with the Pacific Ocean by the Golden Gate strait, which is one mile in width.

San Francisco Bay is supposed by some to have been discovered in the year 1579, by Captain Drake. Drake was a distinguished English navigator. He afterwards became Admiral in the navy of his native country, and was one of the founders of the naval greatness of England. Having been knighted by Queen Elizabeth, he is known in history as Sir Francis Drake. Others believe that the bay discovered by him was the one known at present as Drake's Bay, lying a little north of the Golden Gate strait and indenting the western coast of Marin county. Drake named the country New Albion; and on some old English maps we find California represented under that name.

The other and more probable history of the discovery of San Francisco Bay is, that nearly two hundred years after Sir Francis Drake's visit to, and, as he erroneously believed, discovery of California, the Spanish Government wished to secure possession of the territory of California, a map of which had been drawn up at Madrid as early as the year 1541. For this purpose the Spanish Government sent instructions to the Viceroy of New Spain to found missions and presidios at San Diego, Monterey, and various other parts of the northwestern country. The government of these settlements was put under the control of monks of the Order of St. Francis—two monks being placed in charge of each mission. All the missions were indebted, for their beginning and chief success, to subscriptions contributed by the Church in Spain and Mexico, and forming a fund known as "The Pious Fund of California."

After establishing the Mission of San Diego, the missionaries intended to travel to Monterey and there found a mission. They, however, wandered from their route, and journeyed on till they reached the bay of San Francisco, which is said to have derived its name from the following circumstance: Father Junipero, before leaving Lower California, had received instructions from the agent of the Spanish Government respecting the names of the proposed missions. The names of the saints to whose special patronage they were to be entrusted had been carefully selected from the calendar, but among them that of St. Francis did not happen to occur. "What!" exclaimed the missionary, "is not our own dear father, St Francis, to have a mission assigned to him?" The agent replied: "If St. Francis wishes a mission let him show you a good port, and that shall bear his name." Accordingly, when the missionaries, in traveling northwards, discovered the bay mentioned, they exclaimed: "This, then, is the port to which the visitador referred, and to which the saint has led us—blessed be his name!" They forthwith named it San Francisco Bay, set up a cross, as was their custom, and returned to San Diego. This was in the year 1769.

It was not until the year 1776 that another expedition started from Monterey—traveling by land. It arrived on the 27th of June; and on the 9th of November, 1776, that being the day of St. Francis, founded the Mission of San Francisco de Assisi, which subsequently bore the name Dolores. Besides the mission buildings, consisting of church, dwelling, workshops, etc., there were erected at the same time, and about four miles distant from them, a presidio and a fort. The names of the two monks who founded this mission were Francisco Palou and Benito Cambon, both natives of Spain. The mission remained under the complete control of the missionaries for fifty-eight years—until 1834, when the missions began to pass into the hands of the civil officers of California. They had hitherto been very prosperous, their wealth consisting chiefly in cattle, but also in wheat, barley and merchandise. After passing from the control of the Church to that of the civil government, their downfall was most rapid. One of the first effects of secularizing the mission, thus placing the country under the control of the civil powers and encouraging colonization, was the establishment of the village of Yerba Buena. About two and one-half miles northeast from the mission was a small cove, one mile in width, and extending about one-half mile into the land. It was situated between two projecting points of land, now known as Clark's Point and Rincon Point. This cove, along whose front line the water was forty feet deep, has since been filled in, and where, in 1849, large ships rode at anchor, are now paved streets. The cove was named Yerba Buena. The meaning of Yerba Buena is *good herb*. The name is given to a mint which grows in this region in the form of a vine running upon the ground. The leaves are opposite, and it bears a tiny flower. The plant is very fragrant, is used for a tea, and is said to have medicinal properties. An island bearing the same name lies in the bay about two miles east of the city.

On this cove a small Spanish village had gradually grown up, bearing the same name as the cove. The date of its foundation is disputed; but we know that no village of that name existed before the year 1835. The first dwelling was erected in that year by Captain Richardson. It was simply a large tent, supported on four redwood posts and covered with a ship's foresail. In 1841 the cove was first visited by an American war vessel, the sloop San Luis. Whaleships had come here for supplies as early as the year 1822. In this latter year trade began between California and the United States and England, California's exports consisting mainly of tallow and hides.

The second house in Yerba Buena was built by Jacob Primer Leese. This was erected on the lot which now forms the corner of Clay and Dupont streets, and adjoining the lot on which stood the tent of Captain Richardson. This house was finished on the morning of the Fourth of July, 1836, and these two houses formed the beginning of San Francisco. In eighteen years from that time there was around that spot a population of 50,000. In twice that time—thirty-six years—we have a population of 178,000. Mr. Leese celebrated Independence Day and the completion of his house by a grand banquet, to which guests were invited far and near. Outside of the building floated the Mexican and American flags—the first time the latter was displayed on the shore of Yerba Buena. The first child born in Yerba Buena was the daughter of Mr. Leese and granddaughter of General Vallejo. Her birthday was April 15, 1838.

So late as 1844 Yerba Buena contained only about one dozen houses, with a population of not more than fifty persons. During the years 1842 to 1846 many thousands of immigrants crossed the Rocky Mountains and the Sierra Nevada to settle in California. Others came by the Isthmus and around Cape Horn. The Mexican Government tried in vain to stop this current of emigration.

The war of 1846 between Mexico and the United States terminated in the cession of Upper California to the latter Government.

The first chief magistrate, or *Alcalde*, of San Francisco, was Washington A. Bartlett. On the 30th of January, 1847, Mr. Bartlett published an ordinance changing the name of the town of Yerba Buena to San Francisco. At this time there were only about fifty houses in the place and a population of 375, not reckoning the Indians. By this change of name Benicia, which until then had borne the name of Francisco, was obliged to change its appellation. It then assumed its present name, Benicia.

The growth of San Francisco received a severe check from the report of the discovery of gold. This discovery was made in the month of February, 1848, on the property of Col. Sutter, in El Dorado County. The news spread rapidly, reaching San

Francisco early in the Spring of the same year. A large part of the population hurried, in the greatest excitement, to the placers or gold diggings. San Francisco soon gained by this, however, more than it at first lost; the bay was filled with shipping from many parts of the world, while the fortunate miners returned here to squander or spend their gold; others preferred to remain here and receive the gold of the miners in exchange for supplies, rather than themselves to endure the hardships of a miner's life.

Towards the end of the year 1848, the first rumors were heard of a party or society formed, as the members pretended, for mutual assistance in sickness or danger. This society was called the "Hounds." It was composed of ruffians and villains from all parts of the world; they became so bold as to parade on Sundays, armed with bludgeons and revolvers; at night they attacked citizens of every class, robbing them, destroying their buildings, maltreating and murdering them. At last, in July, 1849, their conduct became insufferable; the respectable portion of the community combined, organized a police force, arrested several of the "hounds," tried them, and sentenced some to be sent to any Penitentiary the Court might indicate. These sentences were not all carried out, but the society was by this means broken up. The success of the people's efforts to free themselves from the power of these ruffians afterwards encouraged them in the formation of the famous "Vigilance Committee."

Associations under the latter name were formed not only in San Francisco, but in Sacramento, Stockton, San José, and other towns; they aided each other in watching and pursuing the destroyers of peace and good order throughout the country.

The discovery of gold in California had caused the immigration of an immense population, strangers to each other, and strangers to the laws of the land. The legal institutions which had grown up with the previous comparatively small population were insufficient for the protection of this sudden increase. Not only the reputation of its wealth, but also the condition of its society, made California especially alluring to desperadoes, rascals, and criminals from all parts of the world. While

America and the different countries of Europe sent a share of such people, the large proportion of them were probably convicted felons sent by England to New South Wales and Van Dieman's Land; from there they easily managed to make the comparatively short voyage to California. Once here the opportunity was but too favorable for the resumption of their former mode of life; for here "prosecutors and witnesses were few or too busy to attend to the calls of justice; here jurors, not knowing the law and eager to be at money-making again, were apt to take hasty charges from the bench as their sole rule of conduct; here Judges, chosen by popular election, were either grossly ignorant of law, or too timid or careless, corrupt, or incapable to measure out the full punishment of crime; here the laws themselves had not yet been methodically laid down, nor the forms and procedure of legal tribunals digested into a plain, unerring system."

These desperadoes leagued together for mutual protection, assistance, and rescue, had their places of rendezvous where the police, few in number, poorly paid, and often in league with the criminals, hardly dared to enter. Moreover, if a criminal happened to be arrested, escape was rendered easy by acceptance of bail entirely worthless, insecurity of prisons, false swearing of witnesses, dishonesty of jurors, and incapacity or venality of Judges.

At length, in 1851, crime, in the forms of incendiarism, burglary, robbery, and murder increased to such an alarming extent that the public became impressed with the idea that the Courts were the *protection* and *refuge* instead of the *terror* of rogues; a great number of the most influential, orderly, and respectable citizens of San Francisco then formed themselves into an association, with constitution and by-laws; the association was called the "*Vigilance Committee;*" it took upon itself to establish good order in the community, and to render life and property secure, although in doing so it was obliged to act independent of the legally-appointed civil officers. The proceedings of the committee were attended with heavy expense, which was borne by voluntary contributions. They exercised the authority they assumed in a quiet and dignified manner. One of the provisions of their constitution was that no person brought before the committee should be punished without a fair trial and conviction. They provided themselves with arms and ammunition, drilled their forces, fortified their headquarters, and constructed cells for prisoners. They arrested and tried rogues and dangerous men, some of whom were hanged, some transported, some acquitted. Many who were suspected or warned by the committee left the country. From all the evidence that can be obtained, it is not supposed that a single instance occurred in which a really innocent man suffered the extreme penalty of death. Those who were executed generally confessed their guilt and admitted the punishment to have been merited.

The Vigilance Committee having restored the city to a tolerable state of safety and tranquility ceased to act, but did not formally disband. In 1855 the city government had again become exceedingly corrupt, and Mr. King, in the *Bulletin* newspaper, criticised in severe terms its action, commenting particularly on the character of a man named Casey (who had served a term in the New York State Prison), a member of the Board of Supervisors, and who had powerful influence over the political caucuses of his party. He was charged with selling nominations for a price, and with furnishing bullies and ballot-box stuffers to elect his nominees; also with procuring the passage of fraudulent bills through the Board of which he was a member. On May 14th Casey murdered Mr. King by shooting him in the street, and then gave himself into the hands of the authorities. The Vigilance Committee, which had never been disbanded, was now put into active operation. The city prison was strongly guarded till the 18th, when a formidable force from the committee demanded Casey, who was surrendered by the Sheriff and taken to the cells of the committee. Charles Cora, a gambler, who had shot Mr. Richardson, the United States Marshal, was also taken from the prison, and after trial, on the 22d of May both were hung in front of the committee's rooms, the people and press sustaining the proceeding. On June 2d a writ of habeas corpus was issued by Justice Terry of the Supreme Court for the rescue of a prisoner in the hands of the committee. No attention was paid to the writ, and on the following day Governor Johnson proclaimed San Francisco in a state of insurrection, ordered out the militia of the city, and commanded the Vigilance Committee to disband and disperse. Very few, even of those opposed to the committee, responded to the call, and practically the power of the State was, for a time, in the hands of the committee. The Governor called on General Wool for United States troops without success; also on the President of the United States. In the meantime the committee continued their labors, banishing prisoners to the Atlantic States, Australia, and the Pacific Islands. Judge Terry, in opposing the arrest of a person who was in his company, stabbed one of the committee's police; the Judge was subsequently arrested and kept prisoner till the man's recovery. A few weeks later the committee surrendered its power, having, during its administration of public affairs, tried and disposed of some thirty cases brought before them; four of their prisoners were executed, one committed suicide while his case was under deliberation, and most of the others were banished from the State. The ensuing election resulted in the choice of city and county officers favorable to the committee, and the city has ever since been comparatively quiet and orderly.

Thus by almost a universal—a national—effort, was our beautiful country which had so long contained and been defiled by the sweepings from the prisons and the thieves' alleys of other lands once more made pure, sweet, and safe. Hercules did no greater labor when he cleansed the Augean stable by turning a river through it. The people of California, and more particularly the people of San Francisco, had turned the great stream of justice from its former slow, devious, and uncertain course, and sent its waters headlong to overwhelm criminals and wash society clean from the stains that crime had left.

Education.—The first American school in San Francisco was a *private* enterprise. It was held in a little shanty, and continued about one year, having been opened in April, 1847. In the latter part of the same year the first *public* school house was built. It was a small cottage, its site being the southwest corner of Portsmouth Square, where Brenham Place enters Clay street. This building was demolished in 1850, that the plaza might be maintained as a completely open and unencumbered square. This school house was in early times the general assembly room of societies of different characters, for religious gatherings, and for public amusements. In 1848 the first Board of School Trustees was appointed, and under their supervision the first public school of San Francisco was opened. This prospered for a couple of months; then news of the discovery of gold in the interior reached San Francisco and most of the inhabitants with their children left for the gold region; the Board of Trustees were scattered; there were no funds provided for the support of the school, and, finally, the teacher, left without pupils or salary, was himself obliged to follow in the wake of the general excitement. In 1850 Colonel T. J. Nevins established a school, which was supported by voluntary contribution. In 1851 the City Government elected the first *Board of Education*, and this Board appointed Mr. Nevins first Superintendent of Public Schools.

Religion —The first Protestant clergyman, the Rev. T. D. Hunt, arrived in San Francisco in October, 1848. He was invited by prominent citizens of different religious persuasions to act as Chaplain for the town. He first held public religious services in the school-house on the plaza. The first place erected especially for religious worship was a tent, situated on Dupont street, between Pacific street and Broadway. For this congregation an edifice was built in New York, and forwarded from there entire, with pulpit, seats, lamps and bell. On its arrival this was erected, in 1850, on Stockton street, near Broadway, and was then occupied by the congregation who had previously worshipped in the tent on Dupont street. Previous to the erection of this building, the Society known as the "First Baptist Church" had built a house for religious worship on Washington street, between Dupont and Stockton streets.

Benevolent Institutions and Societies.—The sufferings consequent upon the long voyage which most of the earlier immigrants to California were obliged to make, the want of comfortable dwellings to protect them from the inclemencies of the weather, and the absence of many comforts and nearly all the luxuries of life, produced so much sickness, poverty and distress, that, at a very early day, associations were formed for mutual assistance and systematic benevolence. So early as 1849 the Free Masons and Odd Fellows had established lodges, and these were followed by the organizing of a temperance society, Society of California Pioneers (August, 1850), benevolent societies for French, Germans and Hebrews, orphan asylums, both Protestant and Catholic, and many other associations for private benevolence and general usefulness.

Cemeteries.—Perhaps nothing better illustrates the spirit and condition of society in the early times of California than the manner of disposing of the bodies of the dead. In the earlier times, when there was but a small number of inhabitants, the church yard at the Mission had been the general place of deposit for the dead; but when the town had become peopled with a larger population of emigrants, strangers to each other, and with no stronger local interest than the gaining of gold, the living could ill afford the time required for accompanying the dead to a final resting-place a mile or two distant, over almost impassable sand hills. Although there was a City Hospital, it was always filled to overflowing; and many a lonely sufferer, found dead, was buried in the sand near the tent which had been the scene of his last suffering. There was a small burying-ground on the top of Russian Hill, which some years before had been thus used by Russian settlers; also a dreary spot on the side of Telegraph Hill was devoted to this purpose; and still later a piece of ground near North Beach. In 1850, what was then considered a large tract of land, was legally and formally set apart as a public burial place, under the name of the Yerba Buena Cemetery, being the present site of the new City Hall, from which the bones of the dead had to be removed before converting the ground to its present use. In 1854 Laurel Hill Cemetery was dedicated to the slumbers of the dead; and still later, Calvary, Masonic, and Odd Fellows' Cemeteries, have been alike consecrated. The former of these lies north of Point Lobos Avenue, and the latter south of the same, and all about midway between the Presidio reservation on the north and on the south, the avenue forming the entrance to the Golden Gate Park. Calvary Cemetery is owned by the Catholics. Besides these there are also two Jewish cemeteries, consecrated as the final resting place of believers in the Hebrew faith. These latter two are situated from two to four blocks south of the old Mission Church and about the same distance west of the San José Railroad.

Telegraphs.—In 1849 a station house was erected on the summit of Telegraph Hill which commanded a view of the Golden Gate. From there the approach and character of all vessels coming into the harbor was signalled to merchants in the city and others. This was a private enterprise supported by voluntary contributions. Afterwards another station was erected at Point Lobos. This was in full view of Telegraph Hill, so that the signals could be communicated to the latter station, while from Point Lobos vessels could be distinguished many miles at sea. In 1853 the first electric telegraph in California was opened. This was eight miles in length, and extended from San Francisco to Point Lobos.

Newspapers.—The first newspaper in San Francisco appeared in January, 1847. It was published once a week, and bore the the name of *The California Star*.

We have seen that the Mission of San Francisco de Assisi was at first a Spanish colony, established, with the others, by instructions received from the Marquis de Croix, who, as Viceroy from New Spain when the latter belonged to the Spanish Crown, acted in accordance with orders received from Spain. The jurisdiction of the Presidio of San Francisco extended over the town of San José de Guadalupe, and the Missions of San Francisco, Solano, San Rafael, Santa Clara, San José and Santa Cruz. But the Spanish Court interfered little with the government of California. A commander-in-chief of the garrisons of the presidios was appointed by the Crown. His duty, however, being merely to protect the missions from hostile Indians, he was not allowed to interfere with the temporal government of the Fathers. The commander-in-chief resided in Monterey, and the Fathers who presided at the different missions exercised full and complete power. They passed laws in regard to property, established penal laws, and even the death penalty, declared peace and war with the Indians, controlled the finances, and held under contribution the Spanish Government itself as well as faithful Catholics all over the world. This state of things continued until the year 1822, when a revolution occurring in Mexico, the latter country threw off its allegiance to Spain, and in 1824 established a republican form of government. This involved the overthrow of the Spanish power in California. The new Mexican Government assembled a Congress and framed a Federal Constitution similar to that of the United States. This Constitution made New California a *Territory* of the Republic, its population being too small to allow of its constituting a *State*. The Mexican Congress appointed a Commander-in-chief for California. But his authority was merely nominal, and then, as previously, the real power vested in the hands of the Fathers.

In 1835, under the first administration of Santa Aña, an attempt was made to centralize at the Federal Capital the power of the Mexican Government. This greatly changed the Constitution of 1824—a change so much disapproved by California as to give rise to a rebellion there. The Californians appointed Señor Don Mariana Guadalupe Vallejo their General, forcibly expelled the Mexican Federal officers, disbanded the Government troops, and declared themselves independent. The Mexican Government was kept too busy suppressing factions nearer home to attempt immediate suppression of the rebellion in California. In 1836 Santa Aña was defeated. But the party that succeeded continued the same policy. The excitement in California against it had, however, by that time, subsided, and in 1837 the people of the latter country peaceably accepted the new Mexican Constitution and swore allegiance to it.

Meanwhile, particularly from the year 1834, the missions had gradually been passing from the control of the Church into the power of the civil authorities. Finally, in the year 1845, a large number of missions were sold at public auction and the remaining missions rented. The money thus raised was divided into three parts, of which the missionaries received one, the second was devoted to the maintenance of the converted Indians, and the remaining third was converted into a fund for the support and extension of education and general charitable purposes.

Thus occurred the decline and fall of the missions in California. The fathers, of course, suffered great loss in thus having the property which they had developed into a source of wealth to themselves seized and sold from them, and this, too, by a Government already their debtor to the amount of $450,000, borrowed from the Fathers by the Mexican Congress for the purpose of carrying on the government.

California, and consequently the Missions, remained under Mexican rule for some time. Meanwhile, during the years 1843, '44, '45 and '46, many thousands of emigrants from the United States settled in California. While the country was becoming rapidly Americanized a quarrel arose between the Mexican officials and the American settlers, in which the Mexican commander attempted to expel the settlers from the country. A general uprising of the Americans ensued, a declaration of independence followed, and active warfare was commenced against the Mexican authorities. Under the lead of Colonel Fremont and Commodore Stockton the Mexicans were defeated. Stockton proclaimed California a territory of the United States, and proceeded to establish a provisional government. The final struggles between the parties took place in January, 1847.

These troubles began before the news of the war between Mexico and the United States, which was declared in April, 1846, and which terminated by the treaty of Guadalupe Hidalgo, ratified in May, 1848. By this treaty California, which had already been conquered by its American population, was ceded, together with other territory, to the United States for the sum of $15,000,000.

The United States Government appointed General Kearney first Governor of the new Territory of California. He was established in this office early in the year 1847.

The rush of emigration was so great that a more substantial government became necessary for a population which soon amounted to a quarter of a million. After some steps taken by the people themselves, General Riley, Military Governor of the Territory, called a convention of delegates to meet at Monterey, September 1st, 1849, for the purpose of framing a State Constitution. Their labors were finished on the 13th of October, and while the signatures were being affixed the guns from the fort were fired thirty-one times, the thirty-first time for California, which was to become the thirty-first State of the Union. The Constitution thus formed was adopted by the people, and on September 9th, 1850, the Congress of the United States admitted California into the Union.

Peter H. Burnett was the first Governor of the State of California. He was inaugurated on the 20th day of December, 1849.

The government of San Francisco of course changed with that of California. Under the Spanish rule the commander-in-chief of the military forces resided at the presidio of the district over which he had jurisdiction. In 1829 General M. G. Vallejo was placed in charge of the country to the north of Santa Cruz; his headquarters were at the Presidio of San Francisco. He remained here in this capacity until the year 1837, exercising until 1835 both the civil and military functions for the section north of San José. In 1835, Governor Figueroa, at the suggestion of General Vallejo, ordered an election of civil officers for the District of San Francisco, fixing the seat of government at the Mission of Dolores; this act dates the first civil organization at this important point. The chief magistrate was called the *alcalde*. The first alcalde of San Francisco was Francisco de Haro.

Under the Mexican laws an alcalde had the entire control of municipal affairs, and administered justice less according to any fixed principle of law than to his own ideas on the subject. When the Americans seized the country they appointed numerous alcaldes, instructing them to administer justice in conformity, as far as possible, with Mexican law and California customs.

On the 13th of September, 1847, the first *ayuntamiento* or Town Council was appointed to assist the alcalde, who found it impossible to transact all the business which now devolved upon him. To the labors of this council the city owes its first systematic municipal foundations.

On September 9th of the succeeding year the largest meeting heretofore ever assembled in San Francisco was held for the purpose of establishing a rate of value for gold dust. Coin was scarce, as yet no mint had been established, it had therefore become necessary to adopt gold dust as currency. The meeting fixed its currency value at sixteen dollars an ounce.

On the 1st of April, 1850, the first election for county officers took place; the most important office to be filled was that of Sheriff, and, after an animated contest, Colonel John C. Hayes was declared the successful candidate.

On the 15th of April, 1850, the city charter was passed by the State Legislature; on May 1st it was adopted by the inhabitants of San Francisco, and municipal officers elected. Colonel John W. Geary, who at the last election had received a unanimous vote for the position of alcalde, which office he still held, was, by a large vote, elected first Mayor of San Francisco. According to the city charter municipal officers were to hold office only one year.

One of the principal acts of Mayor Geary was to veto a bill which had caused great excitement in the community. This bill, passed by the members of the Common Council soon after coming into office, allowed to each of the Board of Aldermen a salary of four thousand dollars a year; they, however, passed the ordinance, by the legal number of votes, over the Mayor's veto, and revenged themselves by refusing, for a long time, to grant the latter officer a salary. This source of dissatisfaction was corrected by the next Legislature, who declared that henceforward the members of the Common Council should not be entitled to any compensation for their services. The action of the Mayor was warmly approved by the people.

On the 15th of April, 1851, the Legislature passed an Act repealing the charter of 1850, reincorporating the City of San Francisco, and enlarging its limits. By this Act the boundaries of the city were fixed on the north and east co-incident with the boundaries of San Francisco County; on the south by a line parallel with Clay street and two and one-half miles distant, in a southerly direction, from the center of Portsmouth Square; on the west by a line parallel with Kearny street and two miles distant, in a westerly direction, from the center of Portsmouth Square.

By an Act, approved April 18th, 1856, the several charters granted to San Francisco were repealed, the government of the *City* and *County* of San Francisco were *consolidated*, and their boundaries fixed and made co-incident. This is called the *Consolidation Act*. It took effect July 1st, 1856. The boundaries of the City and County of San Francisco are as follows: Beginning on the western boundary with a line separating townships two and three south (Mount Diablo meridian); thence running northerly and parallel to the shore so as to be three miles therefrom opposite Seal Rock; thence in the same general direction to a point three miles from shore on the northerly side of the entrance to the Bay of San Francisco; thence to low water mark on the northerly side of said entrance at a point opposite Fort Point; thence following said low water mark to a point due northwest of Golden Rock; thence due southeast to a point within three miles of the natural high water mark on the eastern shore of the Bay of San Francisco; thence in a southerly direction to a point three miles from said eastern shore and on the line first named; thence along said line to the starting-point.

The islands in the bay known as "Alcatraz" and "Yerba Buena," and the islands in the ocean known as the "Farallones," also form a part of the City and County of San Francisco.

The Consolidation Act fixes the day for the election of city and county officers (that of Judges excepted), to be the same as prescribed for general elections throughout the State. In years when no general election is provided for by law, these elections shall be held on the first Wednesday of September.

The city and county officers are elected for two years; their term of office begins the first of January.

Meaning of Spanish names of some places in the vicinity of San Francisco:

Alameda—An avenue of trees.
Saucelito—A little lump of willows.
Contra Costa—The opposite coast.
Point Lobos—Wolves' point.
Point Bonita—Pretty point.
Farallones—Points of rock in the sea.
Alcatraz—Pelican.

A *vara* is a Spanish yard; it is equal to about thirty-three and one-third English inches. The Town of San Francisco was laid out in lots of fifty varas each; six lots constituted one block, bounded by four streets.

Composition of the Soil—We generally say the *soil* consists of earth. Let us take a handful of earth and examine it. First, let a little fall into a glass partly filled with water; the water immediately assumes the same color as the earth. Now pour off this water and then add fresh water, which is again to be poured off, and so continue to do until the water remains clear. The quantity of earth in the glass has become less, and has also lost its black color. A part of it became dissolved in the water, giving to the latter its dark color. This is called *humus*. It is formed from decayed animal and vegetable matter. What remains is genuine earth; or we may also call it *mineral earth*.

Thus we have seen that the soil consists of *humus*, or mould, and of *mineral earth*.

Every leaf that falls upon the ground decays there and produces a part of the vegetable mould. When there is much mould we say the soil is *rich*; when but little, we say it is a *poor* soil. A marshy soil is low land; which is consequently, wet most of the time. Poor soil can be made rich by adding manure to it. Manures enrich the soil either by changing its composition or by acting as a solvent, or absorbent, or they enter the plant as direct nutrition.

Another experiment to be made is to heat a small quantity of earth over a hot blaze until it glows like fire. It now gives out a smell as of something burning. This is the vegetable part of the earth, which part is *combustible*. What remains is *incombustible*—the mineral part of the earth. When the soil is composed wholly of combustible material it is called *turf*. In countries where such soil is found it is used for fuel as we use coal. Turf, or peat beds, are always found in very wet localities. The excessive moisture produces an excessive vegetable growth; this vegetation being still further stimulated by the vegetable mould produced by the vegetation. In the Irish bogs one kind of moss is particularly abundant, growing layer upon layer until in some places it reaches a depth of more than forty feet.

The surface is usually a sponge-like, fibrous mass of mosses, more or less decomposed. At a greater depth its properties as fuel are more valuable, forming near the bottom a black mass which, when dried, resembles pitch or bituminous coal. Peat is also used for manure. The great region of bogs is the central portion of Ireland. We also find them in Scotland, in the lowlands of Northern Germany, and in our own country, where they are called swamps. They extend along the eastern coast as far as the Gulf of Mexico. With us, however, the vegetable matter is in a more decomposed state; it forms a black substance like mud, and is called *muck*.

Here in this glass is another kind of earth—*sand*. Pour water upon the sand, it does not dissolve; hold it over the fire, it does not burn. The sand consists wholly of fine solid grains.

In another glass is a mixture of coarse grains, some larger and some smaller. This is called *gravel*.

Sand is stone, which the forces of nature have ground or *disintegrated* into these small atoms. Gravel is formed in the same way as sand; it is coarser and generally found mixed with it. The sand and gravel found in the soil are not always derived from underlying rock, but often from the disintegration of the rocks of surrounding hills, or of regions more or less distant.

Clay is another ingredient of some soils. It is formed by the *decomposition* of rocks, the purest being that of granitic rocks, which may be considered the original source of clays. Clay is a fine sediment usually found along the banks of rivers, and at the bottom of the ocean, ponds, lakes, etc. When this accumulates in any place it forms a dough-like mass of a flaky structure which resembles thin leaves. We find *beds or quarries of solidified clay*, which easily divides into thin sheets of a rather soft rock or stone. The slate used in the school-room is one example of this, the rock easily splitting into sheets or layers of the thickness of the scholar's slate, or into thicker layers when the slate is to be used for roofing, flagging, flooring, etc. The color of the slate varies, being of a blueish, greenish, or purple color. Besides the clay solidified by *Nature*, there are many varieties which we solidify by *artificial* processes. Among the most important of these are *China* clay, or *kaolin*, used for the manufacture of porcelain; *potters'* clay, for the manufacture of earthen ware; *pipe* clay, a pure variety of potter's clay; *common* clay, for the manufacture of brick; *fire* clay, for fire brick and crucibles; a clay called *fullers' earth*, used, among other purposes, in factories for scouring and fulling woolen cloths, etc. But besides beds of clay, more or less extensive, we also find it *intermixed* with the humus, sand and gravel of the soil. Clay has a great retentiveness for water—hence, in very dry countries where but little rain falls, a clayey soil is much more fertile. Also a soil containing much sand becomes increased in fertility by the admixture of clay; because the sand is itself dry, and allows water falling upon it to filter through, and hence not enough moisture is retained for vegetation; but a proper proportion of clay intermixed with sand retains sufficient moisture for vegetation, and the clay itself, constituting a very nutritious plant-food, we thus have a fertile soil. Too large a proportion of clay, however, is not favorable to the growth of plants, because it is so solid and compact that the roots of the plants cannot easily penetrate it, and thus grow and develop a sufficient amount of root-surface to absorb food enough for the nutriment of a large plant. The fertility of the soil depends not alone upon its *composition*, but also upon its *chemical* condition and the chemical action or processes taking place within it. The plant derives some of its food from the atmosphere, some from the soil; and it is as impossible for it to live without the latter as without the former. The plant derives its food from the soil through its roots; and as the roots can only absorb water, all the nutritive elements of the soil must be dissolved in the water before the plant can take them into itself as food. This solvent action of nutritive elements is effected in part by chemical processes. Since water is the medium by which the plant-food of the soil is transmitted to the vegetable organism, a soil destitute of water is, of course, barren. The great deserts of the world are not sterile because they cannot yield the plant-food necessary to vegetation, but because they are destitute of water to transmit the food from the soil to the plant; and wherever in the desert we find a spring, there, too, we find a spot of verdure, notwithstanding the constant sunshine and parching winds.

Land Considered as Garden, Field, Meadow and Forest: Its Animal Life.—How many of you live in houses with gardens belonging to them? What is planted in them? With what are they fenced or enclosed? Gardens planted principally with flowers, shrubs and ornamental trees, are called *ornamental* gardens. We also hear of *botanical* and *zoological* gardens. Who will tell me what is meant by such? What would you call a place devoted to the cultivation of peas, beans, celery, salad, and strawberries and other kinds of berries? What name would you give to an enclosure filled with apple trees, cherry trees, plum trees, peach and other fruit trees?

In riding through the country we see land planted and cultivated on which are growing chiefly corn, wheat, rye, oats, etc.

What name is applied to such places?
If only grape vines are found, what name?
What is a *meadow?* A *forest?*
What do we mean by *grazing* land?
What animals live in our gardens, fields and forests?

All ground which is planted and tilled is called *cultivated* land; what it produces is called the *crop.* That which grows without cultivation is said to grow wild.

Man cultivates the earth, dressing it with verdure, as he clothes himself with raiment; nature, with wild vegetation clothes the earth, as she does most of the animal kingdom; as we vary the color of our clothing, so the fields and trees, at different seasons, put on different colored robes, as the green field that exchanges its green dress of Spring for a golden-colored one in Summer; and in cold countries nature wraps the earth in an ermine-like mantle of snow.

Neighboring Waters.—We have already learned that the water of the pools and puddles of the street evaporates again after the rain. In this manner a large quantity of water becomes converted into vapor. This aqueous vapor ascends into the atmosphere, there forming *clouds.* These do not remain stationary, but are driven hither and thither by the winds. They are sometimes white, sometimes black, sometimes grey. When the clouds have become saturated to a certain degree with moisture, the latter forms into drops and falls as rain. If very cold, the drops freeze and descend in the form of hail or snow.

All of the rain which falls does not evaporate. Much of it soaks into the earth, falls into the clefts and fissures of rocks, and seeks an outlet for itself at the foot of hills and mountains. Such an outlet is called a *Spring*.

From the springs the water flows onward in little brooks and streams. These streams do not flow in a straight line, but follow usually a winding course. As the streams flow onward they unite with other streams, and together they finally form rivers. Smaller rivers flowing into a large river are called its branches. The commencement of a river is called its source. The place where it empties its waters into another body of water is called its mouth. Which is higher, the source or the mouth of a river? The difference in height between the mouth and the source is called the *fall* of the river.

Where the fall is slight the water flows slowly; where great, rapidly. Where the water falls suddenly from a greater to a less height, it forms *falls*. The ear distinguishes falls by the rushing sound. Are rapids and falls favorable for navigation? For mill wheels? Sometimes the river becomes swollen, either from long rain storms or from the melting of ice on the shores or inland; the river then flows more quickly, and a river which at other times is safe, then becomes dangerous to sail upon. When a river becomes so swollen as to overflow its banks, we call this overflow a *flood*.

A river upon which vessels can sail is called a *navigable* river. Rivers are usually navigable a part of their course only. We speak of a vessel *ascending* and *descending* a river. Which is easier? Why? We also speak of a *favorable* wind and an *unfavorable* wind; a *fair* wind and a *foul* wind. Describe to me what a fair wind would be. A foul wind.

We have spoken of the water of rivers and brooks as running water. But there are also bodies of water which are not called running water. These we name ponds, lakes and seas. Some are natural, some artificial. The greatest of all bodies of water, which may not be called running water, is the *ocean*.

There are also places where the water can not be seen, but where the earth is so saturated with it that it rises at every step we take upon it. These are called *swamps*.

Places in the Vicinity of San Francisco.—This may be an exercise connected with map-drawing. First, let a square be drawn, representing the part of the city which is chiefly built upon. Fixing the location of the City Hall by a point, making the latter the center of a circle, draw a circumference, which shall represent a radius of two miles; then another representing a radius of three miles. Within these two circles locate places between two and three miles distant from the City Hall; afterwards add circle after circle, carefully indicating in each intermediate space the places to be noticed. Additional spaces should be drawn only when the pupils have already become so familiar with the nearer ones that they can readily sketch the circles and locations, noting the number of miles distant and comparing directions. Extend this exercise so as to include Yerba Buena, Alcatraz, Angel Island, Lone Mountain, Seal Rock, Farallones, Saucelito, Oakland, Alameda, San Leandro, etc.

Lines of Communication between San Francisco and Other Places.—As San Francisco is situated on a peninsula, nearly surrounded by deep water, it is natural that the communication with other places should be maintained more by water than by land. Hence, we find as yet but one railroad from the city, while there are many lines of steamers. The Southern Pacific Railroad has its depot in the city. The road extends southward from San Francisco, and in a southeasterly direction through San Mateo and Santa Clara counties. It connects San Francisco with San Mateo, Redwood City, Santa Clara, San José, Gilroy, Salinas, Soledad, and intermediate places.

The water communication is maintained by ferries, bay and river steamers, and ocean steamers.

By *ferries* we have communication with Oakland, and thus with the Central Pacific railroad—with Alameda, San Quentin, Saucelito, Alcatraz, and Yerba Buena Island.

The *bay* and *river* steamers connect San Francisco with Benicia, Martinez, Vallejo, Petaluma, Sacramento, Stockton, and other places.

The lines of *ocean* steamers connect southward with Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, San Pedro—which connects by railroad with Wilmington and Los Angeles, whence stages connect with all parts of Southern California and Arizona—San Diego, Manzanillo, Acapulco, Panam, and other places.

Northward with Tomales, Crescent City, Umpqua River, Portland, Victoria, Sitka, etc.

Other lines connect with Honolulu, Australia, Japan, China and India.

ARITHMETIC.

If there be one branch of the mental training of the schoolroom which, more than any other, requires a *thorough foundation*, this is certainly Arithmetic. Without such foundation it is as vain to expect suitable and good progress to be made, as to demand skillful painting from one who cannot draw a straight line. "Slow and sure" should be the motto for this study in our primary classes. Neglect of this principle will revenge itself, if not on the first teacher, most surely on her immediate successors.

Since the young pupils on entering the schoolroom bring with them no clear idea of numbers, a few, at most, being able to count a little mechanically; since the study of the science of numbers is one of the most difficult of mental operations; since it is not every one who has a talent for it and since it is necessary that the first steps should be made very clear and should be most thoroughly learned, we should, therefore, in the lower classes especially, guard against allowing instructions in this study to cover too much ground.

It is not demanding *too little*, if, with three hours' instruction each week, the pupils learn during the first school year to understand and to perform *correctly* and *rapidly* any and all operations on numbers 1 to 10, of the four rules of arithmetic. If any teacher considers this too low an aim, let him remember that *all* the pupils are to be brought thus far; that they are to learn this *thoroughly*, and that they are to *understand clearly* what they do. To count thus far, forwards and backwards, and to add and subtract a little, is soon learned; but to develop a clear idea of the *meaning* of what they are doing, is something more than teaching a little counting, addition, and subtraction. Not only satisfaction, but rejoicing in the future awaits such a mental discipline in the child's first school year.

MENTAL AND WRITTEN ARITHMETIC.

The next question which arises is, Shall the child be taught *written* arithmetic? Yes, by all means.

a. The use of a slate is an agreeable change to the child. What he has repeated in thought and speech, he now sees represented in certain forms.

b. Reckoning upon the slate is a kind of recreation for the child. The pupil does not need to think so closely as in mental calculation, where he is required to give undivided attention. Moveover, we need not grudge the teacher's lungs a little respite.

c. There is a special advantage in allowing the child to use the slate, inasmuch as here he learns to walk alone—to reckon for himself.

d. Where the use of the slate has been taught in the lowest class, greater progress can be made in the higher classes where the teacher has only to build on the foundation already laid.

Mental arithmetic must, however, always hold the first place in importance. In every-day life and in the whole school-course, it is the principal thing, and hence it should also be the principal thing in the elementary training.

MEANS OF CULTIVATING SENSE-PERCEPTION IN ELEMENTARY ARITHMETIC.

Three things are necessary to thorough and successful instruction in primary classes: (1) Perception by the senses or sense-perception; (2) sense-perception and (3) still, again, sense-perception. Fortunately, means for this are easily supplied.

Firstly, we have stationary numbers on charts; here the numbers, from one upwards, are represented by figures, dots, straight lines, or any other marks.

Secondly, movable representations of numbers, as in the common abacus of the schoolroom.

In the former, the number is fixed, in the latter it must be made; and since the child always has a better idea of what he himself has put together than what is presented to him as a whole, even if the different parts be pointed out to him, the abacus is therefore to be preferred to the chart or the table of figures.

METHOD OF TEACHING ARITHMETIC.

Instead of first teaching to count from 1 to 10, and then to add from 1 to 10, etc.; first take the number 2, then the number 3, then four, and so on, counting as far as each, adding, subtracting; multiplying and adding each, in every way possible without using any figure not yet reached.

In this method there are ten steps for mental reckoning and twelve for slate exercises, thus:

A. Mental exercises (take the number 3, for the example):
1. Making the number. (1+1+1.)
2. Counting forwards. (1, 2, 3.)
3. Counting backwards. (3, 2, 1.)
4. Addition. (2+1. 1+2.)
5. Subtraction. (3—1. 3—2. 3—3.)
6. Multiplication. (3×1. 1×3.)
7. Analysis. (3=2+1. 3=1+1+1.)
8. Division. (3÷3. 3÷2.)
9. Comparison. (3 is 1 more than 2; 2 more than 1.)
10. Illustration problems. (Charles had 2 slates and has bought 1 more; how many slates has Charles now ?)

B. Slate exercises.

11. Most of the above exercises, with various marks.
    (| | + | = | | | . | + | | = | | | .)
12. The same in figures. (2+1=3. 1+2=3.)

It is considerable work to thoroughly go through these exercises on every number from 1 to 10, but it can be completed in the first school-year, and, being done, we may be assured that the pupils will not only have a satisfactory idea of these numbers, but will also have laid a good foundation for their future progress in arithmetic.

PRACTICAL ILLUSTRATION OF THIS METHOD.

The Number One. A.—Mental exercise.

I. *Illustrating the Number One.*—How many stoves are there in the school-room? There is one stove in the school room. How many teachers are speaking to you now? One teacher is speaking now. How many desks does the teacher have? The teacher has one desk.

How many heads have you? (How many noses, mouths, throats, etc.)

I hold up one finger. How many fingers is that? Each of you hold up one finger. Repeat: That is one finger. (The same with the hand, arm, etc.)

I now hold up other objects—a knife, a pen, a pencil, a book, a watch, etc.

Now on the blackboard I make one straight line, one dot, one ring, one cross, draw hastily one tree, one house, one bird, etc., asking each time how many marks is that, how many dots, houses, etc.

II. *Subtraction.*—I write one straight line. How many lines are there? I erase the line. How many lines were there at first? How many have I erased? How many are left now? (The same with dots, rings, etc.)

If I make just one cross on the blackboard and then erase one cross, what is left? We can also say: one from one leaves nothing. Repeat that after me.

III. *Illustrative Problems.*—Freddy had one slate pencil in his pocket when he started for school; on his way to school he lost one slate pencil. How many slate pencils had he left?

Lizzie's mother gave her one biscuit; a little while afterwards she ate one biscuit. How many had biscuits she left?

Alfred had one little heifer. How many? When the heifer was large enough, his father had it killed. How many heifers did he have killed? How many heifers did Alfred have left?

Emma had one apple in her pocket. How many apples? She met a hungry child and gave him one apple. How many? How many did she have at first? How many did she give away? How many did she have left then?

B.—Slate Exercises.

I. *Illustrating the Number One.*—Make one straight mark one dot, one ring, etc.

II. *Subtraction.*—Make one straight line. Erase it. What remains? (Rings, dots, etc.)

III. *The Figures.*—When grown people reckon, they often use a pencil, or a pen, or a piece of chalk. But grown people do not make straight lines, or dots, or rings, but they make figures. I will show you some figures such as grown people make. (I write from 1 to 10.) See, these are only figures. But every one of these figures has a meaning. What they mean you shall learn pretty soon. But now listen to me:

A large boy wanted to write how many satchels, slates, caps, coats, and picture-books he had. He had only one satchel; and now I will show you a figure that he wrote which meant one. He wrote this: 1. He had only one slate, so he wrote again, 1; etc.

This figure, then, means one thing—one thing only; one horse, one house, one fish; therefore, we name this the figure one. What do we name it? What do we mean by a one? How many does it mean?

Then, instead of one straight line, (dot, etc.,) what can I write? Now, try on your own slates if you can make such a figure one as grown people make.

There must also be some ones in your reading books; see if you can find any.

N. B.—This is as far as you can go with the number one without getting beyond the comprehension of the children.

THE NUMBER TWO.

1. *Composing the Number.*—Show me one hand. How many hands are there? There is one hand. Can you show me one hand more? Repeat: there is one hand more. How many hands are there now? How many hands have you, then? We have two hands. The same exercise with arm, eyes, cheeks, ears, etc.

Edward, come here. (He stands before the class.) How many boys are here? Henry, come here, also. How many boys are here now? The same with fingers, pencils, books, caps, etc.

How many ears has a cat? A cat sometimes catches a little mouse. How many ears does the mouse have?

Next make one straight line on the blackboard. How many lines have I made? Another straight line. How many lines have I made this last time? You have made *one* line more. How many line have I made in all? You have made *two* lines. Then how many lines are on the blackboard now? How many line do you see? The same with dots, rings, etc.

Clap your hands together twice. Rap twice on your seats.

II. *Counting Forwards.*—I place one soldier on the desk, and at a little distance, two soldiers. How many soldiers are here? Two. Repeat: there is one soldier, there are two soldiers.

The same exercise with balls on the abacus, and with other objects.

Blackboard.—I write one dot, and at a little distance, two dots. How many dots are here? One. How many here, two. Now, we will count quickly: one, two. What comes first? One. What next? Two.

We have now counted. What have we done? Because we first said the *smaller* number, one, and then the number that means more than one, two, we say we have counted *forwards.* What do we say? Now, count forwards once more. Again, louder.

III. *Counting Backwards.*—Watch closely what I am going to do. How many balls have I here? Two. How many here? One. How many came first? Two. How many next? One. When we count this way, which number must we take first? Two. Which then? One. So, now we count two, one. Count that way yourselves. This time we have said the *larger* number first, and then the smaller, have we not?

The same with other objects. Repeat this many times, always with new objects.

On the Blackboard.—How many crosses have I made here? Two. How many here? One. Which do we take first, the most crosses, or the fewest? The most. And then? The fewest.

When we count this way, first saying the greater number, and then the smaller, we count *backwards.* What do we do? You may count backwards once.

The same with other marks.

Now let us see if we can't count *forwards* again. Give attention to what I write on the blackboard. (| — | | .) Count. Look again. (| | — | .) How must you count this? Backwards. Count.

Close your eyes. Keep them shut close together, Charlie. That's right. Now count forwards. Right. Open your eyes. Who will count forwards alone for me? Who will count backwards? Harry will. But Harry must turn his back to the board so that he cannot see the lines. Watch him and see that he does not look at the board. I think Freddy would like to try it. Would he not? No? Then all count forwards. Backwards. Who would like to count alone right loud? Who can count louder still?

It would be useless to take up more space with these exercises; enough has been said to give an idea of the manner and the method.

IV. *Addition.*—Hold up one hand. How many hands are there? Hold up one hand more. Repeat: here is one hand more. How many hands are there in all? Repeat: One hand and one hand more are two hands.

The same with other objects; but always let the answers be given in a complete sentence, thus: One finger and one finger more are two fingers. One soldier and one soldier more are two soldiers. One ball and one ball more are two balls.

On the Blackboard. What have I made on the blackboard now? (One ring.) What have I made again? (One ring more.) How many rings are there in all? One ring and one ring more are two rings. Repeat it after me. One line and one line more are two lines. One dot and one dot more are two dots. One cross and one cross more are two crosses.

But we can say this a shorter way; we can say, one and one are two. What can we say?

V. *Substraction.*—How many fingers am I holding up? Two. How many fingers are there then? Two. Now, watch carefully.

(I bend one finger slowly down.) Are there two fingers now? No. How many fingers are there? One. How many fingers have I taken away? One. How many fingers remain then if you take one finger from two fingers? When you take one finger from two fingers, one finger remains.

The same with other subjects.

We can say this a shorter way, also; we can say: one from two leaves one; or: two less one is one.

Two boys. How many boys do you see by me? Two. I will put one of them behind the door. How many do you see now? One. How many boys less than there were? One. How many were there at first? Two. When there is one boy less there is only one boy; so we can say: two boys less one boy leaves one boy. Repeat that. Or we can say it shorter: two less one is one. How can we say it?

Look at something quite new which I am going to show you.

How many books have I in my hand? Two. I lay them away one at a time. How many books have I in my hand now? Not any. How is that? Because you have just put them away. How many books did I have? Two. And how many have I laid away? Two. And how many books are left? None. Then if I have two books and take two books away, how many books have I left? None.

Boys, pencils, rulers, etc.

We can say this shorter, also: we can say, two from two leaves nothing; or, two less two is nothing.

On the Blackboard.—How many apples have I drawn? Two. How many have I erased? One. How many are still there? One. (Draw trees, stars, etc.) As before: one from two leaves one.

How many straight lines have I made now? Two. How many have I erased? Two. How many are still left? None. (Dots, rings, etc.) As before: two from two leaves nothing.

Review.—How many are left when you take two away from two? How many when you take only one from two? When you take one from one?

VI. ANALYSIS OF THE NUMBER.

How many balls are on this corner of the abacus? Two. The two balls are so close to each other that they look as if they had grown together, do they not? But look, I can separate these into two parts. How many are in this part? One. And how many in the other part? One. If I put them together we shall have a whole two again. So the number two is made of two parts. Of how many parts is two made? Each part is one ball; therefore I can say: two balls is one ball and one ball more. (Pencils, etc.)

We can say this shorter: we can say, two is one and one more.

Blackboard.—Make two straight lines. How many lines do you see? I will tie them together so that it will be a whole two. (II) Into how many parts could we divide this two? Into two parts. Let us do it. (| |) Of what is this two made? Of one and one.

VII. MULTIPLICATION.

We have seen that two is made from one and one. I will show it to you again. (Two balls close together.) That is a whole two. (Separate the two balls.) How many balls are here? One. How many here? One. Then there is one here and one here; there is only *one* ball each time. *Here* is once one ball, and *here* is once one ball. How many times, then, can you see one ball? Two times. And two times one ball are how many balls? Two balls. Repeat after me: Two times one ball are two balls. We can also say it shorter, thus: Two times one are two. Repeat that after me. (The same with blocks, etc.)

On the Blackboard.—I make a ring on the blackboard. How many rings have I made? You have made one ring. How many times have I made one ring? You have made one ring once. So that it is once one ring. (Make another ring.) How many times have I made one ring now. You have made one ring two times. And two times one ring are how many rings? Two times one ring are two rings. Said shorter it is thus: two times one are two. Repeat it after me. Once more. Once again.

VIII. DIVISION.

James, come here to me. Take these two pencils; hold them up high. How many pencils has James? Two. Charles and John, come here. You shall divide these pencils between you. How many pencils has James? Two. How many boys are to divide these pencils between them? Two. Divide them. Hold them up high so that we can see how many each one has. How many has Charles? How many pencils has John? One. Then when two boys divide two pencils between them, how many does each boy receive? One. Repeat this together: If two boys divide two pencils between them each boy receives one pencil. (Balls, slates, pens, etc.)

Result: When two is divided by two, each has one.

Blackboard.—Draw two apples not very near together. How many apples are there? Two. Frank and Willie come here; you may divide these two apples between you. How many apples are there? Two. How many boys are to divide these two apples between them? Two. Now divide them. How many will Frank have? One. Let him put his finger on his apple. How many can Willie have? One. Let Willie put his finger on his apple. When two boys divide two apples between themselves, how many apples does each receive? One. When two is divided by two, each has one. Repeat it again.

IX. COMPARISON.

I call out two children and give one ball to one and two balls to the other. How many balls has Lizzie? One. How many has Mary? Two. Who of the two has the most? Mary. How many balls has Mary? Two. And Lizzie has only how many balls? One. How many has Mary more than Lizzie? Mary has one more. Then the one that has two has one more than she that has one. Repeat that after me. The one that has two, etc. How many more is two than one? Two is one more than one. (The same with other things.)

Now tell me who of the two little girls has the least number of balls? Lizzie. How many balls has Lizzie? One. How many balls has Mary? Two. How many balls has Lizzie less than Mary? Lizzie has one less. Then she that has one ball has one ball less than she that has two balls. Repeat: she that has one ball, etc. How much less than two balls is one ball? One ball is one less than two balls. We say it shorter in this way: one is one less than two.

Blackboard.—(Make one straight line, and at a little distance two straight lines.) How many lines are here? One. How many there? Two. How many more lines there than here? One. Then two lines are how many more than one line?

Result: two is one more than one.

I draw one tree and at a little distance two trees. How many trees are here? One tree. How many there? Two trees. How many less trees here than there? One tree less. One tree, then, is how much less than two trees? One tree is one tree less than two trees? Shorter: one is one less than two.

X. ILLUSTRATIVE PROBLEMS. A. MENTAL EXERCISES.

a. *Addition.*

Charles had one slate, and his father gave him one slate more; how many slates had Charles then?

Julia ate one cake at breakfast, and one cake at dinner; how many cakes did Julia eat in all?

Bertha broke one plate yesterday, and to-day the careless little girl broke another plate; how many plates did she break in all?

b. *Subtraction.*

In a garden were two apple trees; the wind blew down one of the apple trees; how many apple trees were left standing?

There were two oranges on a plate; Thomas ate one of the oranges; how many oranges were still left on the plate?

Anna had two pins in her shawl; she gave one pin to Susie; how many pins had Anna remaining?

c. *Multiplication.*

Alfred went fishing, and twice he caught one fish; how many fishes did Alfred catch in all?

Emma has twice lost a needle; how many needles has Emma lost in all?

A soldier has twice fired a shot; how many shots has he fired in all?

d. Division.

Ida and Ella had two apples given them to divide between them; how many apples will each have?

If two little boys divide two marbles between them, how many marbles will each boy have?

The stable man has bought two measures of oats to divide between two horses; how many measures of oats must he give to each horse?

e. Comparison.

Benjamin had one picture-book and Jacob had two picture-books; how many more picture-books had Jacob than Benjamin?

Fanny had two nuts in her basket and Rosa had one nut in her basket; which of the two little girls had the fewest nuts? How many less nuts had Rosa than Fanny.

Mr. Smith has two horses and Mr. Jones has also two horses; which of them has the most horses?

B. SLATE EXERCISES.

a. Composing Numbers.

Make one straight line. Make one other straight line. How many straight lines have you made? (Dots, crosses, etc.)

b. Counting forwards.

Make one dot. Make two dots a little way from the one dot. How many dots stand first? How many next? One, two. (Rings, etc.)

c. Counting backwards.

Make two crosses on your slates. Make one cross a ltttle below the two crosses. How many crosses stand first? How many next? Two, one.

d. Addition.

If the children are to reckon on their slates in the four rules from 1 to 10 it is necessary for them to become acquainted with the four signs: + — × ÷. This should be taught immediately with the operations on the number two. I tell them that + means "and" or "add to;" that — means "to take away," and is read *minus;* that × means so many times as the number expresses which stands next to it; that ÷ means we are to divide; and that = means is, are, remains, etc., and is read *equal.*

Although they do not learn immediately, and perhaps not readily, what these signs means, yet, as a general thing, they learn them after a little time without much trouble.

For example: make one straight mark; then make a cross; then another straight mark; then =. How are you to read this example? One straight mark and one straight mark are. And how much are one and one? Two. Very well; now write these two straight marks at the end: | + | = | |. (Dots, rings, etc.)

e. Subtraction.

Make two dots near together; after them make a short horizontal line (—); after that make one dot; then make two horizontal lines after the one dot. Tell me what the one horizontal line means. It means take away. Read the example to me. How many shall we take away? One. From what shall we take away the one dot? From the two dots. How many dots will remain? We will write the number of dots that remain after the two horizontal lines; . . — . = .

Of course the teacher is also to write all this, at the same time as the pupils, on the blackboard.

f. Analysis.

We have already learned what make the number two. What is the number two made of? One and one. We will now make the number two on the blackboard and slates. Make two straight marks; after them make two short horizontal lines. What is it that makes the number two? We will write that next. First make one straight mark. What sign means "and?" A cross. Make such a cross. Now it is read "two is one and." What must we add to that? One straight mark more. Make it. Let us read this example: | | = | + |.

g. Multiplication.

How many was two times one? Two. Let us write that on the slate. Make two straight marks. That is a two. Now we will make a cross of two slanting lines. (×) This cross tells us that we shall take some number as many times as the number that stands before the cross. In short, this sign means "time" or "times." Tell me what you have on your slates now? Two times. Now make one straight mark more, and after it two short horizontal lines. Read what you have on your slates now. Two times one is. Tell me how much is two times one? Two. Very well. So we have only to put two more straight lines at the end of what we have written and it is finished. Read the whole of what you have written. | | × | = | |.

h. Division.

Do you remember how much each one receives when you divide two things between two persons? One thing. When we wish to divide anything we make this sign: ÷. What does this sign tell us to do? To divide. Now, make two straight marks on your slates. These two marks are to be divided; therefore, what sign must we write after them? Two dots, with a horizontal line between them. These two marks are to be divided into two parts; therefore, after the sign you must write two marks and then two straight horizontal lines. How must you read what you have written? Two divided into two parts. How much will there be in each part? One. Then what must we write at the end? One mark. Read what you have written: | | ÷ | | = |.

XI. THE FIGURES.

Make two dots, rings, etc. How many dots are there? Two. Then what is the number two. But grown people write the number two another way; they write it like this: 2. How many does this figure (2) mean? It means two. Now write a two as grown people write it.

Again: how many hands have you? Two. If you wished to write that, how many straight marks would you have to make? Two. But your mother would write it another way. If she wishes to write that there are two eggs in the closet, she does not make two straight marks, but she makes the figure two, thus:

2. This figure means just the same as the number two or as two straight lines. It makes no difference whether we write two straight marks, two rings, two dots, or the figure 2.

WRITTEN ARITHMETIC WITH FIGURES.

a. Addition.

You have learned to make two figures: what are they? One and two. Let us try to write with these figures. Pay attention. I write: $1+1=$. Read what I have written. One and one is. How much is one and one? Two. What figure must I write at the end? A two. $1+1=2$. You may now write the same on your slates.

b. Subtraction.

I write the figure 2. How much does that figure mean? It means two. I write a horizontal line, thus, — after the figure 2. What does that horizontal line mean? It means take away from. I now write the figure 1 and two horizontal lines after it. How shall we read what I have written? Two, one taken away is; or two minus one is. What remains when I take one away? One remains. Then what figure must I write at the end? The figure 1. $2-1=1$. You may now read it.

c. Analysis.

What is it that makes two? One and one. Let us write that with figures. Make the figure 2. After the figure make two short horizontal lines, thus: =. You say two is made from one and one; how many ones must we then make after what we have already written? Two ones. Make them. I also make them, but write them purposely thus: 1 1. Read that. One, one. But it must be one *and* one. What sign must we put between the ones? A cross. Make a cross (+) between the figures. How must we read the whole of what we have written? Two is one and one; or, two equals one and one. $2=1+1$.

d. Multiplication.

Let us now reckon how many two times one is. How much is it? Two. Let us first write it with straight marks, as we did before, thus: | | × | = | | . How do we read that? We will now try to write it in figures. What shall we write first? A figure 2. What next? The sign for "times." What next? A figure 1. How do you read that? Two times one. Now write two short horizontal lines. How much is two times one? Two. Then what must we write last? Two. 2×1=2. You may now write it on your slates.

c. Division.

Now we will divide; and let us try that, also, with figures. How was the sign of dividing or division made? Two dots with a horizontal line between them. We want to divide two cherries between two boys. We must first write what we wish to divide: 2÷. How many boys are to divide them? Two. What figure must we next write? The figure 2. 2÷2. Read what we have now written. Two divided by two. Make two short horizontal lines. How many cherries will each boy receive? One cherry. Therefore, what figure must we write at the end? The figure 1. 2÷2=1. Very well. You may now write it on your slates.

The foregoing is sufficient to show the method to be applied successively to each number from one to ten. Such teaching is indeed a hard task for the teacher's voice; but the arithmetic lesson must ever be considered the hardest in the lower classes, for, added to the great strain on the teacher's vocal powers, it is very difficult to maintain order and the usual school discipline, and at the same time to keep the young minds interested and enthusiastic in the lesson. Moreover, it looks more difficult on paper than it is in practice. Again, no method can be exactly suited to every teacher; the individuality of the teacher must always have scope; let the teacher only never neglect thoroughness, perception, and variety of application.

The following tables will give an idea of how the exercises on the slate should be performed, both with straight marks and with figures, taking the number six as an example:

A WITH STRAIGHT MARKS.

1. *Composing the Number.*

1 1 1 1 1 1

2. *Counting Forwards.*

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

1
1 1
1 1 1
1 1 1 1
1 1 1 1 1
1 1 1 1 1 1

3. *Counting backwards.*

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

1 1 1 1 1 1
1 1 1 1 1
1 1 1 1
1 1 1
1 1
1

4. *Addition.*

1+1
1 1+1
1 1 1+1
1 1 1 1+1
1 1 1 1 1+1

1+1 1
1 1+1 1
1 1 1+1 1
1 1 1 1+1 1

1+1 1 1
1 1+1 1 1
1 1 1+1 1 1

1+1 1 1 1
1 1+1 1 1 1

1+ 1 1 1 1 1

5. *Subtraction.*

1—1
1 1—1
1 1 1—1
1 1 1 1—1
1 1 1 1 1—1
1 1 1 1 1 1—1

1 1—1 1
1 1 1—1 1
1 1 1 1—1 1
1 1 1 1 1—1 1
1 1 1 1 1 1—1 1

1 1 1—1 1 1
1 1 1 1—1 1 1
1 1 1 1 1—1 1 1
1 1 1 1 1 1—1 1 1

1 1 1 1—1 1 1 1
1 1 1 1 1—1 1 1 1
1 1 1 1 1 1—1 1 1 1
1 1 1 1 1—1 1 1 1 1
1 1 1 1 1 1—1 1 1 1 1
1 1 1 1 1 1—1 1 1 1 1 1

6. *Analysis.*

1 1 1 1 1 1=1+1+1+1+1+1
1 1 1 1 1 1=1 1+1+1+1+1
1 1 1 1 1 1=1 1+1 1+1+1
1 1 1 1 1 1=1 1+1 1+1 1
1 1 1 1 1 1=1 1 1+1 1+1

1 1 1 1 1 1=1 1 1+1 1+1
1 1 1 1 1 1=1 1 1+1 1 1
1 1 1 1 1 1=1 1 1 1+1+1
1 1 1 1 1 1=1 1 1 1+1 1
1 1 1 1 1 1=1 1 1 1 1+1

7. *Multiplication.*

1×1
11×1
111×1
1111×1
11111×1
111111×1

1×11
11×11
111×11

1×111
11×111

1×1111

1×11111

1×111111

8. *Division.*

11÷11=1
111÷11=1.
1111÷11=11
11111÷11=11.
111111÷11=111

111÷111=1
1111÷111=1.
11111÷111=1.
111111÷111=11
11111÷11111=1
111111÷111111=1

1111÷1111=1
11111÷1111=1.
111111÷1111=1.
111111÷111111=1

9. *Comparison.*

11 is 1 more than 1
111 is 1 “ “ 11
1111 is 1 “ “ 111
11111 is 1 more than 1111
1111 is 111 more than 1
11111 is 111 more than 11
111111 is 111 more than 111
1 is 1 less than 11
11 is 1 less than 111
111 is 1 less than 1111
1111 is 1 less than 11111
11111 is 1 less than 111111
1 is 111 less than 1111
11 is 111 less than 11111
111 is 111 less than 111111

111 is 11 more than 1
1111 is 11 “ “ 11
11111 is 11 “ “ 111
111111 is 11 more than 1111
11111 is 1111 more than 1
111111 is 1111 more than 11
111111 is 11111 more than 1
1 is 11 less than 111
11 is 11 less than 1111
111 is 11 less than 11111
1111 is 11 less than 111111

1 is 1111 less than 11111
1 is 11111 less than 111111
1 is 1111 less than 11111

B. WITH FIGURES.

a. *Writing of figures, thus:* 2,=11; 3=111; 6=111111.
b. *Forwards:* 1, 2, 3, 4, 5, 6.
c. *Backwards*: 6, 5, 4, 3, 2, 1.

d. *Addition.*

1+1
2+1
3+1
4+1
5+1

1+2
2+2
3+2
4+2

1+3
2+3
3+3

1+4
2+4

1+5

e. Subtraction.

$1-1$
$2-1$
$3-1$
$4-1$
$5-1$
$6-1$

$2-2$
$3-2$
$4-2$
$5-2$
$6-2$

$3-3$
$4-3$
$5-3$
$6-3$

$4-4$
$5-4$
$6-4$

$6-6$

f. Analysis.

$6=1+1+1+1+1+1$
$6=2+1+1+1+1$
$6=2+2+1+1$
$6=2+2+2$
$6=3+1+1+1$

$6=3+2+1$
$6=3+3$
$6=4+1+1$
$6=4+2$
$6=5+1$

g. Multiplication.

1×1
2×1
3×1
4×1
5×1
5×1

1×2
2×2
3×2

1×3
2×3

1×4
1×5
1×6

h. Division.

$2\div2$
$3\div2$
$4\div2$
$5\div2$
$6\div2$

$3\div3$
$4\div3$
$5\div3$
$6\div3$

$4\div4$
$5\div4$
$6\div4$

$5\div5$
$6\div5$

$6\div6$

i. Comparison.

6 is 1 more than 5.
6 is 2 “ “ 4.
6 is 3 “ “ 3.
6 is 4 “ “ 2.
6 is 5 “ “ 1.

1 is 5 less than 6.
2 is 4 “ “ 6.
3 is 3 “ “ 6.
4 is 2 “ “ 6.
5 is 1 “ “ 6.

Of course all these examples are to be given promiscuously, as well as in regular order.

C. ILLUSTRATIVE PROBLEMS.

A hunter went out to hunt. In the forenoon he shot 3 hares, and in the afternoon he shot 3 hares more. How many hares did he shoot that day?

I saw 4 little birds sitting on the roof of a house; after a while two more birds flew on the roof and sat beside them. How many little birds in all were sitting on the roof of the house.

Minnie had a flower garden. One morning she found 1 rose blossomed, and the next morning she found 5 roses more in bloom. How many roses did she find in all?

b. Subtraction.

In my garden there were 6 beautiful trees, but 4 of the trees have been cut down. How many trees remain in my garden?

I had 6 goldfishes in a globe, but 4 of them have died; how many goldfishes are left in the globe?

The old hen had 6 chickens, but a fox caught 5 of them; how many chickens did the poor old hen have left?

c. Multiplication.

George had two marbles with which he was playing. Freddy went running by and called out, Oh, I have 3 times as many marbles as you! How many marbles had Freddy?

Annie said that 3 times 2 are 6; but Jennie said 3 times 2 are 5; which of the two little girls was right?

James was going down the street and saw some boys' coats for sale in the window. I know how much one of these coats costs, said he to the man; it costs 1 dollar; no, said the man, it costs 6 times 1 dollar. Can you tell how much one of those coats would cost?

d. Division.

A mother had two little children; one day she brought home 6 apples to divide between them; can you tell me how many apples each little child received?

A teacher had 6 picture books to divide among those scholars who were very good in school; but there were only 3 good children that day, so she had to divide the 6 picture books among those 3 good children; how many picture books did each get?

Uncle John loves little boys very much, and one day he bought 6 balls to divide among 6 little boys whom he knew; how many balls did he give to each boy?

After the pupils have in this manner been brought as far as the number ten, other exercises on numbers learned may be introduced; and these, as well as all others, it is well for the teacher to prepare beforehand on paper.

Examples.

1. When I have 3, how many are wanting to make 5? When I have 7, how many are wanting to make 10? When I have 5, how many are wanting to make 8?

2. *Place off the Figures.*

a. After 1 comes 2, after 2 comes 3, after 3 comes 4, etc.

b. Before 10 comes 9, before 9 comes 8, before 8 comes 7, etc

c. What follows 3? what follows 6? 8? 9?

d. What comes before 4? before 7? before 9? before 10?

e. What number stands between 2 and 4? between 6 and 8? between 9 and 10?

f. Between what numbers does 3 stand? 5? 7? 9?

3. *Value of the numbers.*

a. What number is one greater than 4? than 6? than 9? What number is two greater than 2? than 4? than 6? than 9? What number is three greater than 2? than 4? than 6? etc. What number is 4 greater? 5 greater? etc.

b. What number is one less than 3? than 7? than 9? What number is 3, 4, 6, etc., less than 7? than 9? than 10?

While resorting continually to sense-perception objects in reckoning—such as dots, lines, abacus balls, etc.—never forget that the ten fingers of the child are the best apparatus of all.

In these mental exercises the children must be animated but quiet. Do not allow them to answer in too low a tone. The answers should always be given in complete sentences. Let the the right answer sometimes be given in chorus, sometimes individually. Let the teacher be animated and spare no words; when tired, rest, and busy the children with some quiet occupation. Be patient, and do not think because you know immediately how many 3 times 3 are, that the child also must answer immediately. Never despair of those who are dull, but work with them hopefully; I have found more "stupid" children in arithmetic than in any other study of the primary classes. To some children who learn other things well, it is almost impossible to teach how many 2 and 1 are; and others seem to be totally wanting in the capacity for learning numbers, as we find grown people with absolutely no ear for music.

MATERIAL FOR BIOGRAPHICAL SKETCHES.

Teachers of Third, Second and First Grades shall give, at the beginning of each month, one name from one of the three series and request the pupils to obtain all possible information in relation thereto.

At the end of the month let several of the pupils state, orally, the information obtained, and then request the entire class to write the sketch:

FIRST SERIES.

Alexander the Great, B. C. 356–323. Hannibal, B. C. 247–183. Julius Cæsar, B. C. 100–44. Charlemagne, A. D. 742–814. Elizabeth of England, A. D. 1558–1603. Gustavus Adolphus, A. D. 1594–1632. Peter the Great, A. D. 1672–1725. Frederick the Great, A. D. 1712–1786. George Washington, A. D. 1732–1799. Napoleon I., A. D. 1769–1821.

SECOND SERIES.

Christopher Columbus, A. D. 1096–1273. John Gutenberg, A. D. 1400–1468. Galileo, A. D. 1564–1642. Sir Isaac Newton,

A. D. 1642–1727. James Cook, A. D. 1768–1779. Mohamed, A. D. 570–632. Peter the Hermit, A. D. 1050–1115. Dante, A. D. 1265–1321. Cervantes, A. D. 1547–1564. Shakespeare, A. D. 1564–1616. Goethe, A. D. 1749–1832.

THIRD SERIES.

Archimedes, A. D. 139–212. Richard Arkwright, A. D. 1732–1792. James Watt, A. D. 1736–1819. Charles Linnæus, A. D. 1707–1778. Cuvier, A. D. 1769–1832. Mozart, A. D. 1756–1792. Raphael, A. D. 1483–1520. Richelieu, A. D. 1585–1642. William Pitt, A. D. 1759–1806. Alexander Humboldt, A. D. 1769-1858.

DECLAMATION AND TRANSPOSITION.

The subjoined poems, selected for declamation and transposition from the Readers in use, shall be committed to memory by the pupils in the specified time affixed, and recited either singly or in concert. Teachers will observe the following steps in the treatment of the selected poems.

1. Explain all difficult words and sentences.
2. Read the poem to the class.
3. Let pupils read either singly or in concert.
4. Let pupils commit to memory.
5. Request pupils to write from memory what has been committed, and then transpose.

FIFTH AND FOURTH GRADES.

Fourth Reader.

A Little Girl to the River	page 43,	seven	weeks.
The Hare and the Tortoise	" 66,	four	"
Boy and Butterfly	" 75,	two	"
Freaks of the Frost	" 104,	four	"
What is Death?	" 109,	five	"
Evening Hymn	" 125,	two	"
The Winter King	" 146,	five	"
Casabianca	" 173,	five	"

THIRD, SECOND AND FIRST GRADES.

Fifth Reader.

Tired of Play	page	45, three	weeks.
Spider and Fly	“	63, three	“
The Festal Board	“	86, four	“
Consolation of Religion	“	95, four	“
The Pebble and the Acorn	“	116, three	“
The Child's Inquiry	“	126, two	“
April Day	“	139, two	“
Death of Flowers	“	143, three	“
The Better Land	“	161, two	“
It Snows	“	167, three	“
Procrastination	“	176, two	“

Eighth Street Grammar School.

No. [illegible]

RULES.

1 To be privileged to draw books from the Library the pupil must have been punctual and regular in attendance, perfect in deportment and good in recitations.

2. No one shall have more than one book from the Library at any time, and no book shall be retained longer than two weeks.

3. Any person defacing, injuring or losing a book shall make compensation for the same.

4. No reference book shall be taken from the school building.